Tobacco Use in Youth of Ecuador (Quito):
Results from the Global School-based Student Health Survey (2007)

An Honors Thesis (HONRS 499)

By

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Abstract

Purpose: To assess the association between tobacco use and selected protective/risk factors in the youth of Quito.

Procedures: The 2007 Quito Global School based Student Health Survey database is now available from the CDC website and was used for the purpose of this study. A secondary data analyses was conducted using SPSS to compute inferential statistics. A total of 2,215 students participated in the Ecuador (Quito) GSHS. Students self-reported their responses to each question on a computerized answer sheet.

Findings: Our study found that more than 1 in 10 Ecuador youth reported smoking cigarettes in the past 1 month. Out of these smokers, almost 1 in 10 initiated smoking when they were 13 years of age or younger. Males were more likely to report tobacco use than females. In addition, there were several risk factors for youth tobacco use in the youth of Ecuador that relate to inadequate parental supervision and parenting, parental smoking or tobacco use, school attendance, and peer support.

Conclusions: Schools and parents should work in close collaboration to alleviate the problem of youth tobacco use in Ecuador. Specifically, schools should conduct periodic assessments of school attendance, academic performance, and prevalence of youth tobacco use. Also, parents should be educated on how to develop effective parenting skills to monitor the academic performance, well-being, and concerns of the youth.
Acknowledgements

I would like to thank Jagdish Khubchandani, MD, PhD, MPH, CHES (Assistant Professor of Community Health Education) for his direction and guidance in the completion of this project. His passion and expertise in global health are unparalleled, and helped me gain critical insights about global health promotion practice. I would also like to thank Dr. Jeff Clark (Professor of Physiology and Health Sciences) for introducing me to the field of health sciences and guiding me towards working with Dr. Khubchandani.

This research paper would not have been conceptualized without the experiences that I had in Ecuador while volunteering with the Timmy Foundation. I want to give special thanks to the Timmy staff, in particular Alana Gilman for her leadership and friendship. These trips left me with moments that I will remember for the rest of my life, and I am honored to be a Timmy alumnus.

I would also like to thank my family for their support throughout my college career.
Author’s Statement

Growing up, I had limited international experience. As a college freshman, I took my first trip out of the country when I participated in a mission trip to San Jose, Costa Rica. It was a fun and exciting new adventure for me. However, it was not until I traveled to Quito, Ecuador that I truly felt that I had experienced and become a part of the people and the culture of another country.

In January 2010, I was in Quito with the Ball State University chapter of the Timmy Foundation, a non-profit organization that facilitates student involvement with international health in developing countries like Ecuador. We spent seven days in Quito, the country’s capital and second-largest city. When we were not hosting medical clinics in the surrounding communities, my group explored the city’s culture and history. Visiting sightseeing destinations like the Catedral del Voto Nacional and El Panecillo gave us a glimpse into the architecture of the city. We gained insight into the culture of the people through an Andean dance company and a historical tour of downtown Quito. I felt like I had a connection with the city.

Despite the link with Quito’s history and culture, it was truly the people I met that made my experience in Ecuador memorable. My team worked with several Ecuadorians throughout the week at the clinics. We had many translators who volunteered their time to ensure that our patients could communicate their concerns and issues to the doctors and staff. Marielena and Vicky, two local nurses, showed their tremendous compassion and caring through their devotion to the health of the people of the communities that we visited.

Most of all, interacting with the patients was the best part of the entire trip. Experiences in international health with the Timmy Foundation allow for students and professionals to
provide basic health care that the people of these neighborhoods would not otherwise receive. Armed with that knowledge, I dove into each opportunity to talk with the patients, putting my Spanish minor to use. It was an eye-opening experience—after seeing how medically underserved these communities were, I felt extremely privileged to have access to things that we as Americans take for granted: over-the-counter medications, medical and health education, and the ability to see a physician for even the slightest ache.

During spring break of 2011, again I had the opportunity to travel to Ecuador with the Timmy Foundation. This time, we were working in the Napo province, located in the Amazon region. Once again, the trip challenged me to grow and develop as a student and aspiring health professional, and once again I became captivated by a new aspect of the country.

When I began the process of choosing my Honors Thesis, once I had decided on a public health topic, I knew that I had to include Ecuador in my work. After determining that the Global Student-based Health Survey had data from three sites in Ecuador, including Quito, I knew that it was the perfect choice to focus on. As I write this paper, I cannot help but think of the people who I met in Ecuador. They are the reason that I am taking on this task, in the hopes that this research will positively affect them in some way.
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Chapter 1

Introduction

This chapter includes the following sections: Introduction, Statement of the Problem, Statement of Purpose, Research Questions, Variables, and Limitations of the Study.

Introduction:

Adolescent tobacco use is a health issue in many countries around the world. For a variety of reasons, cigarette smoking has become increasingly desirable for youth. Although the causes may vary from country to country, youth tobacco use is a worldwide problem. Understanding the specific factors that affect a country’s prevalence of youth tobacco use will make significant advances towards understanding how to prevent adolescents from continuing this behavior.

Statement of the Problem:

Only a few studies have addressed the risk factors for youth tobacco use in developing or poor countries. To date, there has been no published evidence on the risk factors for tobacco use in Ecuador. Thus, the problem addressed in this study is whether youth in Quito (Ecuador) have specific risk or protective factors for tobacco use.

Statement of Purpose:

The purpose of this proposed study is to examine the prevalence of tobacco use in youth of Quito (Ecuador) and to assess the association of tobacco use with parental supervision, peer support, school attendance, and other protective or risk factors. Additionally, the purpose of this
study is to provide recommendations for reduction of youth tobacco use in Quito (Ecuador) based on the results of this study.

Research Questions

The following research questions will be addressed in this study:

- What is the prevalence of tobacco use in the youth of Quito (Ecuador)?
- What are the protective/risk factors for tobacco use in youth of Quito (Ecuador)?

Variables

This study will investigate one level youth (school going students). The participants received a questionnaire which had the following list of dependent and independent variables.

The list of independent variables is as follows:

- Gender of the student (Female/ Male)
- Age of the student (in years).
- Grade in school
- Protective factors for tobacco use.
- Risk factors for tobacco use.

The list of dependent variables is as follows:

- Tobacco use
Limitations

1. The study did not have a 100% response rate. Therefore, there is a possibility that non-respondents would have responded differently. If so, this might be a threat to the external validity of the results.

2. The study was cross-sectional, which would limit the ability to establish cause and effect relationships between parameters estimated by the current study.

3. The survey instrument was primarily closed-format. This would not allow the participants to provide additional information, which could limit insights gained through a different research design. To the extent that important items were missing from the questionnaire, this could be a threat to the internal validity of the results.

4. A variety of respondent errors might have occurred. Faulty recollections, tendencies to exaggerate activities or underplay events or perceptions, and inclinations to give answers that appear more 'socially desirable' are several reasons why a respondent might have provided faulty information. To the extent that this has occurred, it would be a threat to the internal validity of the findings from this study.

5. The survey was monothematic in nature and it might have created a mindset for respondents that may not be indicative of their true perceptions and practices regarding tobacco use. To the extent that this was true, it would represent a possible threat to the internal validity of the results.

The sample chosen for this study was randomly selected students in Quito and may not have adequate representation of Quito students of all age groups, and geographic locations introducing a potential non-coverage error.
Chapter 2

Literature Review

Biological Effects of Tobacco Use

Tobacco cigarettes are known to have many negative effects on the human body. Although cigarettes are made up of many harmful additives, tobacco alone contains several components that are hazardous to the body. Tobacco has $N$-nitrosamines, which form electrophiles that are reactive and increase the risk of oxidative stress (Gupta et al. 2004). These nitrosamines include nitroso-nor-nicotine (NNN), nitrosopyrrolididine (NPYR), nitrosodimethylamine (NDMA), and 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK). Molecules like NNN, NPYR, NDMA, and NNK play a key role in tobacco carcinogenesis (Hoffman 1985).

Jain and Mukherjee (2003) examined the biological basis of nicotine addiction. According to their study, the compounds of NNN and NNK are formed from the alkaloid nicotine, which is the main constituent of tobacco. Nicotine affects the nervous system, and in smoking, it enters the bloodstream through the lungs. It rapidly reaches the brain and crosses the blood-brain barrier. This stimulates adrenal glands, discharges epinephrine, and elevates blood pressure. Nicotine then acts on the peripheral and central nervous system, releasing glucose and dopamine while increasing heart rate and respiration (Jain and Mukherjee 2003).
Tobacco use also affects the body’s cardiovascular system. A study in the American Journal of Medicine examined the cardiovascular risk of seven Latin American cities, including Quito. This evaluation was called the Cardiovascular Risk Factor Multiple Evaluation in Latin America (CARMELA) study, and it looked at 1,638 citizens of Quito, with the mean age of 44.4 years old. The researchers determined that 29.9% of the people surveyed were current smokers, with 8.6% of the total Ecuadorians surveyed suffering from hypertension, 20.2% suffering from hypercholesterolemia, 5.9% suffering from diabetes, 16.3% were obese (with a body mass index greater than or equal to 30 kg/m²), and 13.7% had metabolic syndrome (Schartrotsky et al., 2008).

In particular, CARMELA’s results for hypertension and metabolic syndrome are paralleled by a 2008 Swedish study that was published in the European Journal of Epidemiology. The research focused on sixty-year old men in Stockholm County, and results were compiled from a physical examination and comprehensive medical questionnaire. The subjects were labeled as one of several categories regarding tobacco use: Never used tobacco, Ex-smokers, Ex-smokers and current snuffers, Current smokers, Ex-snuffers, Current snuffers, and Current snuffers and smokers. The results from their physical examination showed that current smokers and ex-smokers had higher prevalence of hypertension (60.2% and 63.0%) than their countrymen who had never used tobacco before (58.0%). These two groups also had higher levels of metabolic syndrome as defined by the International Diabetes Federation, with 34.4% of current smokers and 40.0% of ex-smokers suffering from this condition as compared to the 31.3% of non-tobacco users (Wandell et al., 2008).

Wandell et al. (2008) also found that 4.4% of current smokers and 4.6% of ex-smokers were newly diagnosed with diabetes, with 2.7% of non-tobacco users receiving the same
diagnosis. The researchers speculated that a constant level of nicotine in the body would regulate the hypothalamic-pituitary-adrenal stress response, creating a pre-disposition for type-2 diabetes (Wandell et al., 2008).

Cigarette smoking has an impact on the respiratory system as well. In a 2004 Journal of General Internal Medicine study, Moore et al. used results from the third National Health and Nutrition Examination Survey (NHANES III) to examine effects that marijuana and tobacco use had on the respiratory system. This study’s participants were American adults ranging in age from 20-59 years old, and all qualified participants received a health questionnaire and medical exam. The survey’s results showed that those subjects who only smoked tobacco were 2.44 times more likely to suffer from chronic bronchitis, 5.02 times more likely to have a chronic cough, 3.71 times more likely to produce phlegm, 2.70 times more likely to have shortness of breath, 3.39 times more likely to have wheezing, 4.25 times more likely to have chest sounds, and 1.57 times more likely to have pneumonia than the subjects who were non-smokers. All odds ratios were higher for tobacco smokers than for those subjects who only smoked marijuana (Moore et al., 2004).

Another hazardous aspect of cigarette use is secondhand smoke. Secondhand smoke, or environmental tobacco smoke (ETS) is made up of two types of smoke formed by burning tobacco: sidestream smoke, which comes from the end of a lighted tobacco product, and mainstream smoke, which is exhaled by a smoker who is using a tobacco product. Involuntary smoking occurs if a non-smoker breathes in ETS, and there can be many of the same health effects as direct consumption of a tobacco product. The American Cancer Society estimates that nearly 50,000 Americans die each year from health complications due to ETS (The American Cancer Society, 2010).
Tobacco use has been linked to lowered cognition. Caspers et al. (2010) measured the effects of substance use on adult cognition in a Journal of Study on Alcohol and Drugs article. The subjects were past participants in the Iowa Adoption Studies, which examined genetic and environmental factors of substance-use disorders. Based on self-reporting, these adults were divided into non-smokers (less than 100 lifetime cigarettes), smokers who used less than 20 cigarettes a day, and smokers who used more than 20 cigarettes a day. There were similar rates of tobacco dependence and recency of use between the men and women, but men were more likely to smoke more than 20 cigarettes a day, while women were more likely to smoke less than 20 cigarettes a day (Caspers et al., 2010). The cognition of all participants was assessed by multiple tests: Wechsler Adult Intelligence Scale-III measured global cognition, verbal comprehension, perceptual organization, and processing speed; Wechsler Memory Scale-III determined immediate, general, and working memory; and multiple word and performance tests were used to assess executive-functioning skills. Men did not have any association between tobacco dependence and lowered cognition. However, women who had tobacco dependence had lower scores of perceptual organization, processing speed, and executive functioning than their counterparts without tobacco dependence, with lowered executive functioning abilities reported in women who smoked at least 20 cigarettes a day (Caspers et al., 2010).

Nicotine has effects on hormone levels in the brain. A 2000 Journal of Neural Transmission article states that nicotine has a negative effect on estrogen in the brain. In rats, it was determined that an injection of nicotine significantly decreased binding of the estrogen response element in the hippocampus and cerebral cortex, with inhibition lasting up to two hours after the initial injection. The inhibition occurred at the nicotinic receptors, as indicated by the resulting increased binding after injection of a nicotinic receptor antagonist (Shingo et al., 2000).
Global Prevalence of Youth Tobacco Use

There have been several studies conducted on the global prevalence of youth tobacco use. The Global Youth Tobacco Survey (GYTS) is an assessment tool used to measure the levels of tobacco use in students who are 13-15 years old. A Morbidity and Mortality Weekly Report Surveillance Summary from the Centers for Disease Control and Prevention describes some of the findings from implementation of the GYTS in 140 countries around the world. According to the results of the study, almost 1 in 10 (9.5%) of all the global participants were current cigarette smokers. For the Region of the Americas, where Ecuador is located, the percentage of students who currently smoked cigarettes was 14.3% (Centers for Disease Control and Prevention, 2008).

Youth tobacco prevalence is an issue in the United States as well. In the CDC’s August 27, 2010 Morbidity and Mortality Weekly Report, the researchers found that 1 in 10 (10.3%) of middle school students were current cigarette smokers (Centers for Disease Control and Prevention, August 27, 2010). According to the GSHS, Ecuador is above the regional average for youth tobacco use. From the study, which measured health factors in the cities of Quito, Guayaquil, and Zamora, 15.9% of the subjects had smoked a cigarette in the last thirty days (Centers for Disease Control and Prevention, August 23, 2010).

Blum and Nelson-Mmari’s Journal of Adolescent Health article looked at health of adolescents and young adults on a global scale. Through a literature review, the authors examined many topics, including tobacco use. Their findings showed that the majority of adolescent smokers have tried to stop, which may be due to the lack of comprehensive prevention programs that target youth who have already begun to smoke. The researchers
recommend that the most effective programs should promote youth tobacco use cessation as well as promote prevention from starting tobacco use (Blum & Nelson-Mmari, 2004).

Youth tobacco use has many protective and risk factors. In the following sections of this paper, these predictors are discussed in greater detail.

Risk and Protective Factors for Youth Tobacco Use:

There are many risk factors that are correlated with youth smoking. In one particular study, researchers used the Development and Assessment of Nicotine Dependence in Youth (DANDY) study of sixth-graders in Massachusetts (Doubeni et al., 2008). The researchers focused on only those students who had never experimented with tobacco or had smoked less than once a week at the time of the starting interview. Initially, more than 1 in 5 (21%) of the students had perceived easy access to cigarettes, and almost 1 in 10 (9%) had friends who smoked. In the fourth year of the study, half (50%) thought that they had easy accessibility and almost a third (32%) had friends who smoked. The adjusted hazard ratio for those students who became regular smokers, had perceived accessibility to cigarettes, but did not have peer smokers was 1.16, while the hazard ratio for students who became regular smokers, had peer smokers, but did not have perceived accessibility to cigarettes was 4.85. This indicates that perceived accessibility and possession of peer smokers are independent factors for tobacco use, with possession of peer smokers as a greater factor leading to adolescent smoking. There are several potential reasons for this increase in future smoking: youth often share cigarettes and information about where to purchase cigarettes with their friends (Doubeni et al., 2008).

In a recent study published in the American Journal of Public Health researchers examined any correlation between density of tobacco retailers near schools and youth tobacco
use (McCarthy et al., 2009). Using a survey of California schools, the researchers assessed student tobacco use, including source of cigarettes and peer smoking. The study measured tobacco retailer density by drawing a one-mile radius around the school that simulated the region that students were most likely to spend time in, and counting the number of retailers within this region. The authors reported that almost 1 in 6 (15.7%) established smokers (those who had smoked a cigarette at least 1 day in the last 30 days and had smoked more than 100 cigarettes in their lifetime) had best friends (n=2-4) who also smoked, compared to only 1.0% of the established smokers who had one or fewer (n=0-1) best friends who smoked. This parallels the results for the experimental smokers (those who had smoked a cigarette at least 1 day in the last 30 days, but hadn’t smoked 100 cigarettes in their lifetime), where more than 1 in 5 (23.4%) of those smokers had 2-4 best friends who smoked and only 3.6% of the experimental smokers had 0-1 best friends. As it relates to the density of tobacco retailers, there was not a significant association between established smoking behaviors and density, but there was a significant association between experimental smoking behaviors and density. This association between experimental smoking and retailer density held only for high school students but did not pertain to middle school students (McCarthy et al., 2009).

Cohen et al. (1994) examined multiple risk and protective factors in relation to alcohol and tobacco use. Their study had two cohorts: fifth grade students and seventh grade students. With continuous data collection, the experiment took place over the course of four years for the fifth grade group and three years for the seventh grade group. The surveys gathered information about parenting and peer substance use as well as the student’s own substance use and risk-taking. After adjusted analyses controlling for ethnicity and gender, it was found that the risk
factors like disruptive behavior, peer drug use, self-care, adult family member tobacco use, and adult family member alcohol use were predictors for a higher risk of becoming a new smoker in youth over time compared to the control group (Cohen et al., 1994). The protective factors of parental monitoring, communication, time spent with their child, positive relations, and consistency all indicated lower risks of becoming a new smoker over time compared to the control group (Cohen et al., 1994).

Dishion et al. (2003) researched the role that parental monitoring plays in preventing substance use onset. Their study followed families of middle-school students from sixth grade to ninth grade. The families were divided into a control group and a group that had access to family assessments where a therapist gave feedback and suggestions after monitoring parent-child interactions. School surveys were given to students to measure substance use. The authors reported that for the control group that did not receive the intervention, substance use increased from 7th through 9th grades, and a decrease in substance abuse was reported from 7th through 9th grades for the cohort that did receive the intervention (Dishion et al., 2003).

In a study about the effects of personality, family, and peer determinants on young adult tobacco use, Brook et al. (1997) conducted research by initially interviewing mothers about their children, and conducting subsequent separate interviews with the child and the mother three times during the child’s adolescence and young adulthood. There were two cohorts: younger and older. The interview’s results were used to measure childhood personality, parenting, peer effects, and adolescent personality. The authors reported that factors such as predelinquency, aggression against peers, peer deviancy, peer smoking, and impulsivity were related to young adult smoking for the older cohort. For the younger cohort, variables such as peer marijuana use, peer smoking, self-deviancy, paternal smoking, interpersonal aggression, and low
perception of school achievement were associated with young adult smoking (Brook et al., 1997).

In another study titled “Peer and parent influences on smoking and drinking among early adolescents”, the authors surveyed middle school students in Maryland about substance use, influences of peers and parents, and background information. The results of the study showed that as levels of parental involvement, expectations, and regard increased, the odds for youth smoking decreased. Also, those students who had two or more “problem friends” were nearly ten times more likely to have smoked in the past thirty days than students who responded that they had no problem friends (Simons-Morton et al., 2001).

Simons and Robertson (1989) focused on the effects of peers and parenting styles on youth tobacco use. With a survey of adolescents from 13 to 17 years old, they measured parental rejection, parental drinking patterns, student self-esteem, aggressiveness, involvement in a deviant peer group, avoidant coping, and substance use. The authors reported that parental rejection, aggressive behavior, and being in a deviant peer group were all strong predictors for substance use, whereas those students who reported high self-esteem were less likely to be substance users (Simons & Robertson, 1989).

Ennett and colleagues (2001) studied the relationship between parent-child communication and adolescent substance use. In their research, the authors used adolescent-parent pairs and collected data through interviews. Factors measured included substance use and parent-child communication. Smoking behaviors were divided into initiation and escalation. The authors reported that having one or two parents who smoked led to increased odds of
smoking initiation, while parental monitoring led to decreased odds of smoking initiation and escalation (Ennett et al., 2001).
Chapter 3

Methods

This chapter will describe the methods used in this study. This chapter includes the following sections: Participants, Instrument, Data Collection and Data Analysis.

Participants: 2,215 students in grades 8, 9, 10, and Freshmen.

Questionnaire: The Ecuador questionnaire has 82 questions, ranging from student-generated responses, such as height and weight, as well as multiple-choice questions. The GSHS is composed of three types of questions: core modules, core-expanded questions, and country-specific questions.

There were eleven core modules:

- Alcohol use
- Dietary behaviors
- Drug use
- Hygiene
- Mental health
- Physical activity
- Protective factors
- Respondent demographics
- Sexual behaviors
- Tobacco use
- Violence and unintentional injury
Data Collection: The Centers for Disease Control and Prevention trained country representatives to administer the questionnaire through a GSHS survey implementation workshop. Ecuador’s representative is Patricio Jácome Salazar, tobacco liaison for the Ministry of Health. There was a two-stage cluster sample design for the selection of subjects. For the first stage, schools were selected with a probability proportional to the school’s enrollment size. For the second stage, a random selection of classes occurred, and all students in these classes were able to participate.

<table>
<thead>
<tr>
<th>School Response Rate</th>
<th>92%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Response Rate</td>
<td>93%</td>
</tr>
<tr>
<td>Overall Response Rate</td>
<td>86%</td>
</tr>
<tr>
<td>Total number of students in Quito study</td>
<td>2,215</td>
</tr>
</tbody>
</table>

Data Analysis

Data from the study were analyzed using SPSS 17.0. Data analysis included descriptive statistics with a report of the appropriate frequencies, means, and standard deviations to describe the responses to the questionnaire items as well as the demographic and background characteristics of the respondents. Binary logistic regression analyses was conducted to assess the relationship between the outcome variable (tobacco use) and selected protective factors (independent variables)
Chapter 4

Results

The results of the current study are presented in this chapter. The sections in this chapter include: Demographic characteristics of the respondents, tobacco use behavior, description of selected protective and risk factors, association of tobacco use behavior with risk factors and protective factors, and Summary.

Table 1. Demographic Characteristics of the Respondents

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11 years or younger</td>
<td>162 (7.3)</td>
</tr>
<tr>
<td>12 years old</td>
<td>518 (23.4)</td>
</tr>
<tr>
<td>13 years old</td>
<td>524 (23.7)</td>
</tr>
<tr>
<td>14 years old</td>
<td>425 (19.2)</td>
</tr>
<tr>
<td>15 years old</td>
<td>375 (16.9)</td>
</tr>
<tr>
<td>16 years old or older</td>
<td>188 (8.5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1116 (50.4)</td>
</tr>
<tr>
<td>Female</td>
<td>1078 (48.7)</td>
</tr>
</tbody>
</table>

[Mean and Std. Error]

| Weight (kg) | M=50.27(±0.31) |
| Height (m)  | M=1.52(±0.002) |
The students’ ages ranged from 11 years old to over 16 years old, with the plurality of students at age 13. Majority of the students were males (50%).

Table 2. Tobacco Use behavior

<table>
<thead>
<tr>
<th>Tobacco Use behavior</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among students who smoked cigarettes during the past 12 months, the percentage who tried to stop smoking cigarettes.</td>
<td>Category 1</td>
</tr>
<tr>
<td>Of students who smoked cigarettes on one or more of the past 30 days, the percentage who tried their first cigarette at age 13 or younger</td>
<td>Category 2</td>
</tr>
<tr>
<td>Percentage of students who have a parent or guardian who uses any form of tobacco.</td>
<td>Category 3</td>
</tr>
<tr>
<td>Percentage of students who reported people smoking in their presence on one or more days during the past 7 days</td>
<td>Category 4</td>
</tr>
<tr>
<td>Percentage of students who used any other form of tobacco, such as Havana or pipe on one or more days during the past 30 days</td>
<td>Category 5</td>
</tr>
<tr>
<td>Percentage of students who smoked cigarettes on one or more days during the past 30 days</td>
<td>Category 6</td>
</tr>
</tbody>
</table>

The majority of students had been in the presence of tobacco smoke in the last 30 days. Only 1-in-10 (11%) of those students who smoked cigarettes in the past year tried to stop cigarette smoking.
### Table 3: Description of Selected Protective and Risk factors

<table>
<thead>
<tr>
<th>Protective/Risk factors</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>During the past 30 days, on how many days did you miss classes or school without</strong></td>
<td></td>
</tr>
<tr>
<td>permission?</td>
<td></td>
</tr>
<tr>
<td>0 days</td>
<td>1776 (80.2)</td>
</tr>
<tr>
<td>1 or 2 days</td>
<td>295 (13.3)</td>
</tr>
<tr>
<td>3 to 5 days</td>
<td>71 (3.2)</td>
</tr>
<tr>
<td>6 to 9 days</td>
<td>24 (1.1)</td>
</tr>
<tr>
<td>10 or more days</td>
<td>24 (1.1)</td>
</tr>
<tr>
<td><strong>During the past 30 days, how often were most of the students in your school kind and</strong></td>
<td></td>
</tr>
<tr>
<td>helpful?</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>201 (9.1)</td>
</tr>
<tr>
<td>Rarely</td>
<td>450 (20.3)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>502 (22.7)</td>
</tr>
<tr>
<td>Most of the time</td>
<td>488 (22.0)</td>
</tr>
<tr>
<td>Always</td>
<td>519 (23.4)</td>
</tr>
<tr>
<td><strong>During the past 30 days, how often did your parents or guardians check to see if your</strong></td>
<td></td>
</tr>
<tr>
<td>homework was done?</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>347 (15.7)</td>
</tr>
<tr>
<td>Rarely</td>
<td>351 (15.8)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>322 (14.5)</td>
</tr>
<tr>
<td>Most of the time</td>
<td>357 (16.1)</td>
</tr>
<tr>
<td>Always</td>
<td>821 (37.1)</td>
</tr>
<tr>
<td><strong>During the past 30 days, how often did your parents or guardians understand your</strong></td>
<td></td>
</tr>
<tr>
<td>problems and worries?</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>363 (16.4)</td>
</tr>
<tr>
<td>Rarely</td>
<td>400 (18.1)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>374 (16.9)</td>
</tr>
<tr>
<td>Most of the time</td>
<td>371 (16.7)</td>
</tr>
<tr>
<td>Always</td>
<td>674 (30.4)</td>
</tr>
<tr>
<td><strong>During the past 30 days, how often did your parents or guardians really know what you</strong></td>
<td></td>
</tr>
<tr>
<td>were doing with your free time?</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>378 (17.1)</td>
</tr>
<tr>
<td>Rarely</td>
<td>355 (16.0)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>357 (16.1)</td>
</tr>
<tr>
<td>Most of the time</td>
<td>379 (17.2)</td>
</tr>
<tr>
<td>Always</td>
<td>680 (30.7)</td>
</tr>
</tbody>
</table>

The majority of students had never missed classes in the past 30 days. There was an even distribution between students who reported their classmates were rarely, sometimes, most of the time, or always kind and helpful. For those students whose parents or guardians did not always...
check to see if their homework was done, there was an even distribution between the other answers. This was also true for those students who felt as though their parents or guardians did not always understand their problems and worries, as well as those parents or guardians who did not always know what their students were doing with their free time.

Table 4: Predictors of Tobacco Use Behavior

<table>
<thead>
<tr>
<th>Risk Factors for Tobacco Use</th>
<th>Odds Ratios (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M 1.50 (1.15-1.95)</td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>Students who missed classes or school without permission on one or more days during the past 30 days.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Ref</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Yes 4.84 (3.66-6.41)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students who reported that most of the students in their school were never or rarely kind and helpful during the past 30 days.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Ref</td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>Yes 1.58 (1.20-2.08)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students whose parents or guardians never or rarely checked to see if their homework was done during the past 30 days.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Ref</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Yes 2.23 (1.71-2.91)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students whose parents or guardians never or rarely understood their problems and worries during the past 30 days.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Ref</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Yes 2.30 (1.76-2.99)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students whose parents or guardians never or rarely really knew what they were doing with their free time during the past 30 days.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Ref</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Yes 2.66 (2.03-3.48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students who had a parent or guardian who uses any form of tobacco</td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>No Ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes 1.63 (1.23-2.16)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All of the results had statistical significance (p-value <0.05). Males were 1.5 times more likely than females to have smoked cigarettes during the past 30 days. Students who had missed
classes or school without permission during the past 30 days were nearly 5 times (4.84) more likely than those students who never missed classes to have smoked cigarettes during the past 30 days. Students who reported that their classmates were never or rarely kind and helpful during the past 30 days were 1.58 times more likely than those students who reported that their classmates were kind and helpful to have smoked cigarettes during the past 30 days. Students whose parents or guardians rarely or never checked to see if their homework was done were 2.23 times more likely than students whose parents or guardians checked their homework to have smoked cigarettes during the past 30 days. Students whose parents or guardians rarely or never understood their problems and worries during the past 30 days were 2.30 times more likely than those students whose parents or guardians understood their problems and worries to have smoked cigarettes during the past 30 days. Students whose parents or guardians rarely or never really knew what they were doing with their free time were 2.66 times more likely than students whose parents or guardians knew what they were doing with their free time to have smoked cigarettes during the past 30 days. Students whose parents or guardians used any form of tobacco were 1.63 times more likely than those students whose parents or guardians did not use any form of tobacco to have smoked cigarettes during the past 30 days.

Summary

There are multiple parenting and schooling risk factors that increase prevalence of youth tobacco use in Quito (Ecuador).
Chapter 5

Conclusions

The conclusions of the current study are presented in this chapter. This chapter contains the following sections based on the results of this study: Summary of results, implications for government and practitioners, and recommendations.

5.1 Summary of Results

There are several protective and risk factors for youth tobacco use. Many of these factors are based on the adolescent’s school and home environment. The factors vary from parental tobacco use, gender, perceived classmate helpfulness, and perceived parental involvement, understanding, and knowledge of their child’s activities.

5.2 Implications for Government and Practitioners

Measures for youth tobacco cessation are crucial in order to shape a healthy future for the world. Prevention strategies for early onset tobacco use are the key to lowering the rates of youth smoking. In Ecuador, this is becoming an increasingly difficult task, because a majority (77.0%) of their youth smokers first tried a cigarette when they were fifteen years old or younger, and 3.1% tried their first cigarette at age seven or younger (Centers for Disease Control and Prevention, 2008).
Once they begin smoking, adolescents have difficulty quitting, even if they want to change the problem behavior. In spite of the knowledge of the health risks, a little less than a third (29.6%) of current youth smokers in Ecuador said that they did not want to quit smoking now (Centers for Disease Control and Prevention, 2008). The students’ perceptions of the difficulty of smoking cessation may be a predictive factor for the prevalence of youth tobacco use. When asked whether it is difficult to quit smoking, almost a third (32.0%) said it is definitely not difficult, 14.4% said that it is probably not difficult, and a little less than a third (28.6%) said that it was probably difficult. This means that a majority (74.9%) did not believe that smoking cessation was definitely difficult. In addition, a little less than half (46.4%) believed that it was not difficult at all to quit smoking (Centers for Disease Control and Prevention, 2008). If the students believe that it is not difficult to quit using tobacco, there is a possibility that they may be less likely to attempt to do so because they believe it is easy to quit at any time in the future.

A lack of desire to quit smoking may be due to the fact that students do not feel that they have the resources and support to do so. Of the 929 students surveyed in the Global Youth Tobacco Survey who had smoked before, 27.8% said that they had never received help or advice from a program or professional, or from a friend or family member to help them stop smoking (Centers for Disease Control and Prevention, 2008). This may be because the adolescents did not ask for help or advice and it may also be due to a lack of education and programming in tobacco cessation.

It is important to prevent youth tobacco use because if students do not use tobacco at a young age, they will not be as likely to begin using tobacco as an adult. In the Mathers et al. (2006) Addiction review of studies that looked at the implications of youth tobacco cessation on adult tobacco use, it was determined that smoking of any kind at age 16 doubled the odds of being a frequent smoker at age 18.5 when compared to 16 year old non-smokers. Similar results were found for smoking behavior in the last year of high school; at this time, both smoking and non-smoking students continued those behaviors for
years after high school (Mathers et al., 2006). Therefore, cessation of tobacco use as an adolescent can have long-term benefits as an adult.

Tobacco cessation also will have long-term benefits for the students’ future children and potentially will prevent these youth from becoming smokers. According to a study published in the American Journal of Public Health, a non-smoking adolescent who lives with a tobacco user had the same odds ratio of being susceptible to tobacco use as a non-smoking adolescent who had received free tobacco (Altman et al., 1996). This means that once a student who uses tobacco becomes a tobacco-using adult and parent, his or her child will become more susceptible to tobacco use.

Youth tobacco use can be prevented by employing many different methods. According to Flay’s Theory of Triadic Influence, there are four main variables that influence youth tobacco use: pricing, advertising and promotion, access, and prevention programs (Flay 2004). These can be categorized as affecting tobacco supply (pricing, advertising and promotion, and access) and demand (prevention programs). If progress is to be made in Ecuador, a comprehensive tobacco cessation plan must address all of these issues (Flay 2004).

Before 2003, there was no international legislation that governed the various aspects of tobacco use. However, on May 21, 2003, the World Health Assembly adopted the World Health Organization’s Framework Convention on Tobacco Control (Framework Convention on Tobacco Control, 2011), and it entered into force on February 27, 2005 (FCTC. 2011). This treaty has standards and recommendations for tobacco policies and programs. A country can choose to adopt the FCTC, which indicates that the signing party will support and implement at minimum the policies of the FCTC. Currently, there are 172 countries that are parties to the FCTC. This includes Ecuador, who signed on March 22, 2004, and ratified on July 25, 2006. All parties in the FCTC must submit a two-year report and a five-year report that outlines the progress that the country has made toward enforcing the treaty’s policies. Ecuador’s two-year report was submitted on October 23, 2008, and its five-year report will be submitted on October
For this study, all of Ecuador’s current progress on tobacco control is in relation to the 2008 report (FCTC, 2011).

One aspect of the Theory of Triadic Influence is advertising and promotion. This is relevant to the FCTC as well, because Article 11 of the treaty is concerned with the health warnings on tobacco packages. According to the two-year report, Ecuador currently does not have a ban on deceitful terms of tobacco packaging. In this case, deceitful means the packaging would leave a false impression about the health risks of the tobacco product, such as “light”, “mild”, or “low tar” (FCTC, 2011). Requiring a ban on these types of descriptors would ensure that potential youth smokers will probably not become attracted to the seemingly healthier types of cigarettes and start smoking with the misperception that they are not harming their health. Another component of Article 11 is the rotation of health warnings on the cigarette packages. An occasional change of warnings would prevent the health message from becoming stale, thereby preventing the warning from becoming overlooked. Ecuador does not require rotation of health warnings, but doing so would be a simple way to keep the dangers of cigarette use fresh in the minds of consumers. A third aspect of Article 11 is the package’s requirement of images of the potential health hazards of tobacco use. These visceral pictures can be a strong deterrent to tobacco use, especially for young people. They would also be effective for people who are illiterate and cannot read the other health warnings that are present on the packaging. According to UNICEF, around 16% of Ecuador’s population is illiterate (UNICEF, March 2, 2011). Many of the FCTC’s recommendations for advertising and promotion of tobacco products are manageable, with the potential for long-term, positive benefits for the consumer.

Flay also suggests that pricing is another way to control youth tobacco use. According to the Global Youth Tobacco Survey, 38.0% of students in Quito spent a dollar or more in the last thirty days on cigarettes, although 50.1% of students had less than a dollar or no money in a normal month as an allowance, stipend, or salary (Centers for Disease Control and Prevention, 2008). This means that despite the low levels of personal income, students are still able to purchase cigarettes, or to have cigarettes
purchased for them. However, increasing the pricing and taxation of cigarettes would make it more difficult for students or their suppliers to purchase these products.

A third component of youth tobacco cessation is access to tobacco products. Decreasing the perceived accessibility of cigarettes is one potential way to decrease youth cigarette use. Students can have multiple access points to tobacco products, both legal and illegal. Despite Ecuador's legal tobacco age requirement of 18 years, students in Quito who had smoked in the past thirty days were most likely to receive their cigarettes from a store, shop, or street vendor, with more than a third (39.9%) of smokers obtaining products from those locations (Centers for Disease Control and Prevention, 2008). This is also reflected in the GYTS, where although only 2.0% of the students surveyed were 17 or older (in the range of legal tobacco purchase), a little less than half (47.7%) of the students who tried to buy cigarettes in the last 30 days were able to buy cigarettes without vendor refusal because of their age (Centers for Disease Control and Prevention, 2008).

The concept of reducing access to retail tobacco vendors in order to reduce sales is one worth considering. A decrease in the perceived availability of tobacco can be achieved by licensing vendors, enforcing current laws regarding minors, limiting the number of tobacco retail outlets, and creating zoning restriction to prevent sale near schools. These restrictions would have a negative effect on experimental high school smokers, who are the most likely to receive their source of tobacco from a retail outlet. These students are also the ones who had the greatest perceived ease in obtainment of tobacco (McCarthy et al., 2009).

Although tobacco retail store density in school areas has some association with how smokers obtain their cigarettes, there is no correlation between the density of tobacco retail stores in school areas and perceived ease in obtainment of cigarettes and the daily number of cigarettes smoked. There is also no relationship between proximity of retail tobacco stores and any kind of experimental or established smoking behaviors. This would indicate that even if many tobacco retail stores are located in close
proximity to a school area (less than one mile radius), there would not be associated behavioral changes that would lead to increased smoking of established or experimental smokers. However, a relationship was found between experimental smokers who borrowed cigarettes and tobacco retail density, which indicates that when there is a high density of tobacco retailers near a school, experimental smokers are more likely to get their cigarette from someone who has purchased it from one of those retailers (McCarthy et al., 2009). This increase in borrowing tobacco products from those of legal age indicates that in order to decrease youth tobacco use, there must be a stigmatization of youth tobacco use as a socially unacceptable action. Otherwise, if underage smokers are unable to legally purchase tobacco, they will just turn to social sources like their friends and family to obtain their cigarettes (Jason et al., 2007).

The location of the school in an urban or rural area also affects the students' sources of tobacco. A plurality of established smokers in rural areas has their cigarettes purchased by someone else, and nearly half (48.3%) of all experimental smokers in rural areas obtain their cigarettes by borrowing from someone. These results indicate that in these rural locations, students receive the majority of their tobacco from a source secondary to retail outlets. For an urban area like Quito, the plurality of established smokers received their tobacco from a store, while the plurality of experimental smokers receiving their tobacco by borrowing it from someone else. Both of these results could potentially be remedied by reduction of tobacco retailer density in school locations (McCarthy et al., 2009; Jason et al., 2007).

McCarthy and colleagues' (2009) results regarding perceived accessibility parallel those found by Doubeni et al. (2008), where it was shown that although perceived accessibility of tobacco products has a slightly increased relationship with established or regular smoking, those students who do not have perceived accessibility to tobacco, but do have peers who smoke are 4.85 times more likely to be regular smokers than their counterparts who have neither peers who smoke nor perceived accessibility. This indicates that peer smoking is a stronger motivation to begin regular smoking habits than perceived accessibility to tobacco (Doubeni et al., 2008). This is reinforced by the fact that 24.5% of students
would probably or definitely smoke a cigarette if one of their best friends offered it to them (Centers for Disease Control and Prevention, 2008). Although the results are daunting, an overall reduction in youth smoking would decrease peer smoking as well, which makes it all the more important that youth tobacco cessation is achieved (Doubeni et al., 2008).

Addressing the supply aspect of tobacco use is an important way to limit youth tobacco use. However, focusing on the demand aspect is equally imperative. Two main components of cessation through tobacco demand are prevention programs and pharmaceutical therapy. Results from the GYTS indicate that there could be more opportunities in the school health curriculum for education of the effects of tobacco use. According to that survey, 46% of the students either were not taught in classes about the dangers of smoking or were not sure that they had been taught about this topic. When asked about the topic of reasons why people their age smoked, a majority (65.2%) stated that they had not discussed this in their classes. When asked about the health risks of smoking, a plurality (43.8%) said that they had not talked about any of these risks in class. When asked about how long it had been since they had discussed smoking in a lesson, 27.8% said that they had never discussed it, and 52.9% stated that it had been at least a year since they received a lesson on smoking and health (Centers for Disease Control and Prevention, 2008). If students are educated on these topics, they will be better informed and empowered to make healthy decisions about tobacco use.

A primary way to target adolescent tobacco users is the prevention program. Prevention programs can be classified as risk prevention and reduction, protection, or both. For effective intervention to occur, it should be based on at least one of the social-situational, person, or environmental theories. Programs that used all three theories, were coupled with program school, parent, media, community, and policy components, and that were practice-based had significant long-term results in lowered daily, weekly, and monthly smoking (Pentz, 1999).
According to Dusenbury and Falco, there are eleven components of effective drug abuse prevention curricula, and in accordance with Pentz, successful programs should utilize multiple factors to provide comprehensive assistance for the students. With all theories, there are several components that should be present for the teacher or leader. Using interactive teaching techniques such as role-playing, discussions, and small group activities allows students to become engaged in learning. Providing information about tobacco that is appropriate to the developmental stage of the students is important as well. For adolescents, there is an emphasis on concrete information coupled with examples and reasons that have immediate results (Pentz, 1999; Dusenbury & Falco, 1995).

The person theory focuses on the attitudes, normative expectations, and beliefs of the students. For changes in attitudes, programs should focus on fostering skills of decision-making, assertiveness, and communication. The normative expectation aspect should correct the student’s present social normative expectation through teaching that the majority of people do not use tobacco. To change beliefs, the program should utilize public commitment statements to stay tobacco-free as well as appraisal of tobacco-use risk and consequences (Pentz, 1999; Dusenbury & Falco, 1995).

The social-situational theory examines modeling, group pressure, and support. Of the programs that teach social resistance skills, those that are school-based are the most successful. By practicing in real-life settings and role-playing, students have the opportunity to view appropriate and realistic behaviors that can be modeled in their own lives. Through peer-pressure resistance, students will be able to stand up to the social pressures of smoking. Teaching support-seeking behaviors is a way for students to find assistance when there are difficulties in their attempts to quit tobacco use (Pentz, 1999; Dusenbury & Falco, 1995).

The environmental theory deals with mass communication and diffusion. A successful program that uses the environmental theory will enable its students to identify and counteract the effects of the media (Pentz, 1999; Dusenbury & Falco, 1995).
It is necessary for programs to have adequate coverage and sufficient follow-up, with the most effective programs having at least seven sessions. The duration of the program sessions and boosters is related to program effectiveness in reduction of long-term smoking behaviors (Dusenbury & Falco, 1995). When programs are composed of multiple sessions, the lessons and concepts of the programs are reinforced over time, giving the student an overall more concentrated education in tobacco cessation.

With any program, improvement and growth comes from introspective evaluation of the strengths, weaknesses, and areas for improvement. To examine a program, one must find the successful components of the program, ways that the program would be effective in various parts of the country, and how new research can be used to advance the first and second points (Pentz, 1999). Although specific content can have its importance, in a 2009 Journal of School Health study, Adams et al. determined that consistently enforcing a school’s tobacco policies is more relevant to program effectiveness than the actual content of the program (Adams et al., 2009). Despite these findings, the best method for tobacco

Tobacco use is a highly important health issue that affects millions of people in developing countries around the world. In particular, Ecuador is in need of multiple policy changes in order to facilitate tobacco cessation for its young citizens. These changes especially will have drastic positive impacts on the health and well-being of Ecuadorian adolescents. Although this study mainly focused on the urban city of Quito, parts of these recommendations can be applied to the diverse places throughout the country. Once adolescents quit using tobacco, there will be positive effects for adult users as well. Youth tobacco cessation can have benefits for adult tobacco users as well. As found in a recent study (Nilsson et al., 2008) when participating in a Swedish youth tobacco cessation program, 24.8% of all adults also quit tobacco to support the child that they were sponsoring. This had significant impact on regular users, as 53.1% of the daily tobacco users in the study had quit their habit. When compared to the 0.6-0.8% smoking cessation of the general population in the duration of the study, it can be inferred that supporting a child to quit tobacco use can have positive results for the sponsor as well (Nilsson et al., 2008).
Another important recommendation for Ecuador is that the country continues to take part in the Global School-based Student Health Survey as well as the Global Youth Tobacco Survey. Future participation in these assessments will provide continued monitoring of progress and setbacks, and will accurately depict the country’s health profile. In addition, implementation of the CDC’s Global Adult Tobacco Survey, the Global Health Professional Student Survey, and the Global School Personnel Survey is highly recommended. These assessments will give a more comprehensive profile of the country’s level of tobacco use, cessation, and education (Centers for Disease Control and Prevention, November 18, 2010).

5.3 Recommendations for Protective Factors

The results of the analysis show that parenting protective factors are highly correlated with youth smoking behaviors. From this, there are many potential recommendations in order to decrease tobacco use as it relates to protective factors.

Students who missed classes at least one time in the last thirty days were nearly five times as likely to have smoked a cigarette in the last thirty days as their peers who had not missed classes. This indicates that parents should ensure that their child is attending all of his or her classes. Taking a proactive step and communicating more with their child’s teachers and school administrators is one way to check for tardiness.

Checking homework is a behavior that can have positive results for tobacco cessation. Those students who had parents who never or rarely checked their child’s homework were 2.23 times more likely to smoke in the last thirty days than those students with parents who did check homework. Parents should become more involved with their child’s homework; if they are unable to help their child with his or her homework, they should at least make sure that their child is completing the assignment. Studies
show that as the level of parental involvement, expectations, and regards increases, the odds ratio for youth smoking decreases (Simons-Morton et al., 2001; Dishion et al., 2003).

With students whose parents never or rarely understood their problems 2.30 times more likely to have smoked in the last thirty days than those students whose parents understood their problems, it is important for the students to feel as though they can go to their parents with issues. Schools could offer counseling and advising programs for parents to teach them how to better understand the problems and worries of adolescents. If schools are unable to offer these services, they should at least direct parents to a source where they can receive this information. Doing so will have many benefits for the student. Positive relations and communication between parent and child has been shown to lower the risk of youth tobacco use (Cohen et al., 1994), while parental rejection can increase the risk of smoking (Simons & Robertson, 1989).

The analysis shows that students whose parents never or rarely knew what the student was doing in his or her free time were nearly three times more likely to have smoked in the last thirty days than those students whose parents knew what their child was doing in his or her free time. Parents should have a better idea of what their child is doing with his or her free time; if the parents are unable to do so because of work or other commitments, they should enlist the help of a family member, neighbor, or friend. This is an example of parental monitoring, which can decrease the odds ratios of smoking initiation and escalation, ensuring that the child does not begin tobacco use (Ennett et al., 2001).
AUTHOR’S CONCLUSIONS

Working on this project has taught me a lot about the field of public health. Before I took on this task, I did not know about the different types of public health research, or even what kind of work went into the research. Doing the statistical work, making the analysis of the results, and determining the recommendations and implications from those results have increased my knowledge and problem-solving skills.

This project has much more relevance to my future plans now than it did when I first began writing the thesis in January. I have been accepted into two programs for public health: Tufts University School of Medicine and Oregon State University’s Masters of Public Health programs with a concentration in Global Health. Although my ultimate career goals still include an MD, if I choose the MPH training, it will be an important and relevant aspect of my education. Now I have a tangible, real-world educational experience that I can apply to my future work in public health. Although I will learn a lot about global health in the future, I already have started improving my knowledge of the field with my work on this thesis.
REFERENCES


