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ABSTRACT

BAN A. MAJEED

Racial and Geographic Differences among Callers to the Georgia Tobacco Quit Line, October, 2005- April, 2007

(Under the direction of MICHAEL ERIKSEN, director, Institute of Public Health)

The majority of smokers - regardless of race - wish to quit. Quitting tobacco use is a top national priority to improve the quality of life for all people. There is a wide range of effective tobacco addiction treatment strategies. Telephone counseling services or Tobacco Quit Lines (TQL) is one of the effective smoking cessation aids available to all people in the U.S. free of charge. This is a cross sectional analysis of data from Georgia Tobacco Quit Line (TQL). The study examined the differences in the utilization rates of the Georgia TQL by different smoking population. Analysis revealed that 2.9 per 1000 male smokers in Georgia called the TQL compared to 5.0 per 1000 females. Also, the rate of calling among black was significantly higher than that among white smokers. Television commercials promoting the use of the TQL were successful in reaching the Black smokers.

INDEX WORDS: tobacco use, black and white smokers, gender, residential setting, and telephone counseling

RACIAL AND GEOGRAPHIC DIFFERENCES AMONG CALLERS TO THE
GEORGIA TOBACCO QUIT LINE, OCTOBER, 2005-APRIL, 2007

By

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MS.C. AI-NAHRAIN UNIVERSITY

M.D. AI-NAHRAIN UNIVERSITY

A Thesis Submitted to the Graduate Faculty
of Georgia State University in Partial Fulfillment
of the
Requirement for the

MASTER OF PUBLIC HEALTH

ATLANTA, GEORGIA
2008

RACIAL AND GEOGRAPHIC DIFFERENCES AMONG CALLERS TO THE
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I would like to express my appreciation to all my colleagues and friends who were more than a family to me.

Ban Majeed

Author's Statement

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LIST OF TABLES

Number	Title	Page
4.1	Description of the general characteristics of the study population	29
4.2	Gender distribution of smoker callers to the Georgia TQL according to race	30
4.3	Gender distribution of adult callers and smokers in Georgia	30
4.4 a	Distribution of smoker callers to the Georgia TQL according to race and residential setting	31
4.4b	Racial distribution of adult smokers in Georgia	32
4.5	Mean adult age differences between adult black and white smokers who called the Georgia TQL during the study period	33
4.6	Distribution of educational attainment according to gender	33
4.7	Distribution of educational attainment of callers according to race	34
4.8	White educational attainment distributed according to residential setting	34
4.9	Black educational attainment distributed according to residential setting	35
4.10	Distribution of callers according to race and age groups	36
4.11	Distribution of callers according to Georgia Public Health Districts	37
4.12	Distribution of callers according to race and Public Health Districts	38
4.13	Callers and smoking prevalence in Georgia Public Health Districts	39
4.14	Distribution of types of chronic diseases among callers	40
4.15	Distribution of chronic disease score among callers	40
4.16	Distribution of chronic disease by race	41
4.17	Distribution of methods by which callers heard about TQL by race	42
4.18	Distribution of methods through which callers heard about TQL by race and residential setting	43
4.19	Services requested by tobacco user callers of the TQL	44
4.20	Current smoking status of callers	44
4.21	Distribution of mean smoking start age by race	45
4.22	Distribution of mean smoking start age by residential setting	45
4.23	Distribution of mean smoking start age according to race and residential setting among callers of the TQL	45
4.24	Distribution of cigarette using habits of current smokers by race	46
4.25	Frequency distribution of cigarettes smoked per day among current smokers by race	46
4.26	Average number of cigarettes smoked per day by race	47
4.27	Distribution of cigarettes smoked per day by age	47
4.28	Cigarettes smoked per day distributed according to residential setting	48

4.29	Types of tobacco used by smokers calling the TQL	48
4.30	Distribution of mean smoking duration by race	49
4.31	Duration of smoking in years distributed by race and residential setting among current smokers	49
4.32	Distribution of mean smoking pack years by race	50
4.33	Mean smoking pack years distributed by race and residential setting	50
4.34	Distribution of smoking pack years according to race	51
4.35	Distribution of smoking pack years of smokers by residential setting	52

LIST OF FIGURES

Number	Title	Page
3.1	Rural and urban Georgia counties map	27
3.2	Georgia Public health Districts map	28
4.1	Rate of callers per 1000 smokers by gender	31
4.2	Distribution of callers by race and residence	32
4.3	Age distribution of callers	36
4.4	Distribution of chronic disease score by race	41
4.5	Mean smoking pack years distributed by race ad residence	51

TABLE OF CONTENTS

	<u>Page</u>
ACKNOWLEDGMENT	iii
LIST OF TABLES	vii
LIST OF FIGURES	ix
CHAPTERS	
1. INTRODUCTION	1
Research Questions	4
2. REVIEW OF THE LITERATURE	5
3. METHODS AND PROCEDURES	
Data Sources	21
Study Variables	21
Statistical Analysis	28
4. RESULTS	30
5. DISCUSSION AND CONCLUSION	54
REFERENCES	71
APPENDICES	
A: List of Counties	77
B: Georgia BRFSS Data Summary	81

CHAPTER I INTRODUCTION

A thorough examination of the literature continues to show that smoking is the main preventable cause of disease and death in the United States (Andoh, et al., 2008; Bentz, et al., 2006). Schroeder (2005) reported that tobacco use causes about 440,000 deaths per year in the U.S. Smoking causes more deaths than HIV/AIDS, alcohol and drug abuse, car accidents and suicides combined. Smoking deaths are primarily caused as follows: 33% CVD, 22% pulmonary diseases, 28% lung cancer, and 7% other types of cancer. In addition, more than 8.6 million Americans suffer from additional chronic diseases related to tobacco use (Schroeder, 2005).

Lung cancer ranks as the highest cause of cancer death among both men and women. The American Cancer Society (ACS) projected that 174,470 Americans would have lung cancer by the end of 2008 (Shugarman, et al., 2008). In the state of Georgia about 79% of lung cancer cases are due to smoking (Bryan & Thompson, 2007). Globally, it is estimated that by the end of 2015 around 10% of deaths will be due to tobacco consumption (Pisinger, et al., 2008). In addition to death and disease smoking leads to approximately a \$92 billion loss of productivity in the U.S. (Cokkinides, et al, 2008).

According to the 2006 Georgia Behavioral Risk Factor Surveillance System (BRFSS), results 19.9% of Georgian adults smoke. This rate is similar to the national rate of 20.1% smokers in the U.S. (Bryan & Thompson, 2007).

Racial and ethnic minority groups - especially those living in rural and medically underserved areas (Northridge, et al., 2008) - carry a heavier burden of tobacco related illnesses (Cokkinides, et al, 2008). The office of smoking and health at the CDC is seeking to eliminate the tobacco related health disparities as part of the efforts to address smoking among minority populations (Louis, 2008). Tobacco addiction is considered as a chronic disease and patients who want to quit need to be provided with the supportive interventions (U.S.DHHS, 2000B & CDC, 2005).

The Institute Of Medicine (IOM) 2004 report identified quitting tobacco use as a top national priority to improve the quality of life for all people (Swartz, et al. 2005). It is important to note that the majority of smokers - regardless of race - wish to quit (U.S.DHHS, 2000B; & Cokkinides, et al., 2008). There is a wide range of effective tobacco addiction treatment strategies (Cokkinides, et al., 2008). They include: use of pharmacotherapy, counseling services, or a combination of interventions. Telephone counseling services or Tobacco Quit Lines (TQL) are effective smoking cessation aids (Platt, et al., 1997) that are available to all people in the U.S. free of charge (Hunt & Hepburn, 2006).

In November 2001 the Georgia TQL began operation (Georgia TQL website, 2008) serving 1.3 million smokers (Bryan & Thompson, 2007). There are 3 direct phone numbers providing services for English and Spanish speakers and another for deaf or those hard of hearing. A third party is offering translation services of TQL counseling for over 140 languages, provided by AT & T. It is in operation everyday and closed only on Christmas, Thanksgiving and Independence days. The Georgia Department of Human Resources/Division of Public Health funds the TQL from the 1998 Master Tobacco

Settlement Agreement money. Quit Line counseling services are operated by Free and Clear Inc. The United States Department of Health and Human Services (USDHHS) launched the National TQL services in November 2004. The National TQL toll free number is 1-800-QUITNOW. Callers to this number are asked for their zip code and are then routed to their corresponding states where they receive requested services (Schroeder, 2005). The following are types of services are offered by the TQL: counseling (either reactive or proactive); pharmacotherapy assistance; referral of callers to other local smoking cessation services; mailing of self-help materials; and online information (CDC, 2004). TQL faces several challenges, including securing financial resources. Financial resources are not only required to operate the TQL but also to promote it and in some states to cover the cost of pharmacotherapy (Schroeder, 2005).

The tobacco prevention literature recommends regular assessment of the utilization trends of tobacco cessation intervention and studying the use and outcome of the state-funded TQL (For example Swartz, et al., 2005 & Curry, et al., 2007). The number of smokers using tobacco cessation aids has been slowly increasing over the past decades. Some studies have examined the racial differences in the utilization of these aids. Uncovering any racial and regional differences in the smoking and quitting habits is imperative to assist minority groups in their efforts to reduce tobacco consumption (Cokkinides, et al., 2008). Using data collected for callers October, 2005- April, 2007, the current study was designed to evaluate selected demographic and communication factors related to the use of the Georgia TQL. The CDC recommended that states regularly evaluate their TQL services aiming at the following: generating knowledge to improve the service; providing the health department with quality assurance mechanism to assess

venders; and evaluating the volume and impact of utilization (CDC, 2004). The availability of this data set presented a distinctive opportunity to examine the characteristics of the callers to TQL among smokers in Georgia. The data set included information on callers during the period of October 2005 - April 2007. Based on trends in tobacco prevention literature, this study sought to examine the following research questions:

With respect to the utilization of the Georgia TQL:

1. Are there racial or geographic differences among smokers in the rate of utilization?
2. Are there differences in the rate of calls per 1000 smokers across the 18 Georgia public health districts?
3. How did callers hear about the Georgia TQL.?
4. Are there racial or geographic differences in the smoking pack years among callers?

CHAPTER II LITERATURE REVIEW

Tobacco use is the major cause of premature death, disease and loss of productivity worldwide (Warren, et al., 2008). Epidemiologic surveys showed that there are 45 million smokers in the United States (Fiore, et. al., 2008). In the U.S. smoking leads to 440,000 deaths (Schroeder, 2005) and approximately a \$92 billion loss of productivity annually (Cokkinides, et al., 2008). Smoking is continuously viewed as a socially undesirable habit and some smokers even feel stigmatized (Zhu, et al., 2000; Stuber, et. al., 2008). The majority of tobacco users want to quit (Cokkinides, et al., 2008). In 2005, approximately 43% of all smokers in the U.S. mentioned that they attempted quitting smoking during the previous 12 months (Van Deusen, et al., 2007). Over the past recent decades, the number of smokers utilizing smoking cessation aids and quitting smoking has been increasing steadily yet slowly (Cokkinides, et al., 2008).

The Healthy People 2010 document identified reducing smoking prevalence among adults from 24% to 12% as one of the national health priorities (U.S. DHHS, 2000). To reach this goal the Community Guide on Preventive Services recommended the application of the following anti-tobacco strategies: increasing tobacco unit price; legislation and policies for clean indoor air and public smoking bans; mass media messages to counter tobacco marketing and to de-normalize smoking; tobacco

commercial bans; and the provision of cessation aids (Schroeder, 2005; Fiore, et al., 2008).

Al-Delaimy, et al. (2007) observed that interventions aimed at helping smokers quit also helped smokers who were unable to quit to reduce their smoking intensity. For example, raising the tobacco unit price was shown to have an impact on smokers' habits and frequency of smoking (Al-Delaimy, et al., 2007). Many smokers start reducing the number of cigarettes consumed per day as a step towards quitting (Al-Delaimy, et al., 2007). One-third of the smokers surveyed in Europe expressed a desire to quit. Yet, they were still waiting for the right opportunity to actually do so (Thyrian, et al., 2008).

Racial Groups and Smoking

Racial and ethnic minority groups differ in their smoking and quitting habits. The 1998 Surgeon General Report entitled "Tobacco Use Among U.S. Racial/Ethnic Minority Groups" was dedicated to examine these variations (U.S. DHSS, 1998). In addition, several researchers were interested in exploring these aspects such as: LaVeist, et al. (2007); Andoh, et al. (2008) and Cokkinides, et al. (2008).

Minority groups are known to carry a heavier burden of tobacco related adverse effects among all smoking populations (Cokkinides, et al., 2008). An examination of the literature showed that White teens tend to start smoking earlier than blacks who rarely start smoking regularly before the age of 18 (Fagan, et al., 2007). However, blacks have lower successful quit rates than white smokers (Fagan, et al., 2007). Evidence suggested that compared to whites, black smokers were less likely to be screened and receive any

advise regarding tobacco consumption by health care providers. In addition, fewer black smokers utilized smoking cessation aids when they planned to quit (Cokkinides, et al., 2008).

Residential Setting and Smoking

It was documented that smokers living in rural areas tend to smoke heavier than their urban counterparts (Northridge, et al., 2008). Northridge and his colleagues (2008) reported that adult rural Appalachians have higher tobacco consumption and elevated rates of Coronary Heart Disease (CHD) deaths. The authors suggested some factors responsible for the observed high smoking prevalence among Appalachian residents. For example: they live in tobacco-growing areas; lack access to tobacco cessation programs; lack media resources resulting in reduced exposure to anti-tobacco educational programs, have limited transportation options; and have lower levels of education. Furthermore, they tend to be fatalistic, a characteristic that may affect their views on lifestyle modification in general and smoking cessation in particular.

Smoking Starting Age

Globally, gender differences are trivial regarding teens' susceptibility to initiate smoking (Warren, et al., 2008). Smoking intensity and frequency differ according to age. Smoking intensity increases with age (Al-Delaimy, et al., 2007). In Hong Kong, the majority (62% - 67%) of the surveyed smokers indicated that they started smoking regularly at the age of 10-19 years (Abdullah, et al, 2004). In Georgia, USA, smoking prevalence among adolescents attending middle and high school in 2005 were 9% and

19% respectively (Kanny, et al., 2006). Early physical maturation was suggested to be responsible for the early initiation of tobacco and alcohol use among teens (Ge, et al., 2006). Those who mature earlier than peers were more likely to smoke (Ge, et al., 2006). Several risk factors are associated with tobacco and other substance-use during teenage years including impulsivity, risk-taking, novelty seeking, and externalizing problems (Ge, et al., 2006). Moreover, those who started smoking earlier in life (before the age of 16) had a harder time quitting (48.5%) compared with those who started when they were older (60%) (Northridge, et al., 2008). Pisinger et al. (2008) documented that the higher the starting age, the better the odds of successfully quitting, and vice versa. Smokers who started smoking at younger ages are usually heavier smokers and more addicted. Hence, young people are known to have a harder time staying abstinent and usually report more relapses (Curry, et al., 2007).

Effects of Media

Media has a powerful influence on tobacco image among people - especially the young, the poor and the less educated. Therefore, tobacco companies make special effort to target these groups with smoking ads (Lee, et al, 2007). Media can also play a very positive role in encouraging healthy behavioral changes. Short repeated messages on TV, radio, and print media were shown to be helpful in promoting the use of tobacco cessation aids and they have the potential to reach a wide segment of the population (CDC, 2000 b). Computerized interventions such as (E-Health) or internet-interventions can play an important role in reaching many people at very low cost per person (Fiore, et

al., 2008). This is an excellent venue to reach the young technology-native generation that is at high risk for starting to smoke (Grimshaw & Stanton, 2006). Well-conducted media promotion campaigns have been proven to raise the success rate for quitting (CDC, 2000 b). Media have the ability to promote and normalize the belief that stopping smoking was a common and achievable goal among smokers in general (CDC, 2004). This in turn helped boost their self-efficacy in their ability to quit (Janz, et al., 2002).

Smoking Cessation Interventions

In general, smoking cessation intervention options involve one or a combination of the following:

- *Counseling* it is defined as cognitive therapy that helps change the way smokers think about tobacco. Positivism (positive thinking), relaxation, mental imagery, motivation and encouragement are a few of the tools used in such intervention strategies (Gilbert, et al., 2005; Schroeder, 2005). Intensive intervention counseling was associated with a 22% successful quit rate (Schroeder, 2005). Counseling can be direct (face-to-face), or delivered over the phone through Tobacco Quit Lines (TQL).
- *Pharmacotherapy* helps smokers cope with withdrawal symptoms. There are several Food and Drug Administration (FDA) approved smoking cessation drugs such as nicotine replacements in different forms, and psychotropic medications. FDA approved the use of Bupropion, an anti-depressant during the quit smoking

process. Most smokers need multiple interventions to achieve successful abstinence (Schroeder, 2005).

Use of Smoking Cessation Aids

Smokers who use smoking cessation aids while quitting are known as help-seekers (treatment-seekers), while those who quit without help are called self-quitters. These two groups differ with respect to sociodemographic characteristics. Treatment-seekers are more likely to be White, educated, and older than those in the self-quitter group (Hughes, et al., 1997). Family and friends support was cited as the most important aid for informal tobacco cessation by smokers willing to quit of all ages (Curry, et al., 2007). One-third of adult smokers surveyed in NHIS 2005 mentioned relying on the support of family and friends to help them quit. Only 2% of smokers in the general population reported using any kind of traditional behavioral or counseling therapies such as calling the TQL (Curry, et al., 2007). Medications were used by 18% -32% of smokers of different age groups (Curry, et al., 2007).

Role of Health Care Providers

Advising patients who are smokers to quit is one of the most important ways health care providers help prevent disease and promote the health of the patients they serve (Bentz, et al., 2006; Freketich, et al., 2008). The majority of smokers acknowledge the harmful effects of tobacco (Andrews, et al., 2001; Kanny, et al., 2006) and wish to quit. Yet, succeeding in quitting is not easy (Heishman, et al., 2002). Ninety percent of smokers have already tried to quit on their own (Andrews, et al., 2001). There are various

factors preventing smokers from successfully quitting including: the physiological addictive quality of nicotine, cognitive impairment and other withdrawal symptoms (Heishman, et al., 2002). Some smokers rely on tobacco as a means to help them cope with depression. Poor black women cited smoking as a form of affordable pleasure and a way of coping with depression (Andrews, et al., 2007). Health care providers need to keep these problems in mind when dealing with smoking patients (Heishman, et al., 2002).

Analysis of the Italian National Tobacco Survey 2004-2006 data showed that only 22% of smokers were screened by health care providers regarding smoking (Ferketich, et al., 2008). The 2008 update of the Clinical Guidelines for Tobacco Treatment emphasized the importance that health care providers follow these steps when encountering a smoking patient (Fiore, et al., 2008): The steps are known as the 5 A's:

- Ask every patient about tobacco use or smoking.
- Advise smokers to quit.
- Assess readiness to quit.
- Assist patients to make that change.
- Arrange for follow up (Schroeder, 2005).

Providers frequently fail to provide smoking cessation advice to their smoking patients (Bentz, et al., 2006). Several barriers that have been identified that prevent them from delivering smoking cessation services, including: "lack of awareness, lack of familiarity,

disagreement, lack of self-efficacy”, and difficulty in changing well established clinical practices (Blumenthal, 2007, p 272).

Tobacco Quit Line (TQL)

Helplines, Telephone or Tobacco Quit Lines (TQL), and hotlines are “telephone-based programs” designed to assist tobacco users to quit (Cummins, et al., 2007, P: i9; Carlini, et al., 2008). TQL provide information, counseling and support for all population groups (Schmitt, et al., 2007; Anderson & Zhu, 2007). In addition, TQL play an important role in promoting the use of pharmacotherapy (Stead, et al., 2006). TQL has proven to be effective in helping tobacco users quit smoking in the U.S. (Stead, et al., 2006), UK and Australia (Abdullah, et al, 2004). TQL has been shown to be effective in both clinical trials and in real world settings (Zhu, et al., 2002).

Funding

TQL services are funded by the government and provided to the public at no cost. Telephone-based cessation interventions are financed by a tobacco tax or Master Tobacco Settlement money (Anderson & Zhu, 2007). The CDC recommended a range of expenditure for every state to attain an effective tobacco control program. Yet, many states regardless of the available tax money for this purpose- do not invest the same recommended amount of money (CDC, 2005). The amount of money that states spend ranges from \$0.07 to \$8.32 per smoker (i.e. per potential caller to the TQL) (Cummins, et al., 2007). Cummins and group (2007) detected a positive correlation between the amount of money invested in the TQL and the utilization volume.

TQL Effectiveness

Pletcher, et al., (2006) defined TQL counseling as “telephone counseling in which at least some of the contact is initiated by the quit line counselor to deliver tobacco use interventions, including call back interventions” (P 91). Telephone counseling comes in two forms: proactive and reactive. The proactive form refers to the counselor calling the smoker, while the reactive form refers to the smoker initiating the contact (Stead, et al., 2006). Intensive tobacco intervention therapy has been shown to be more effective than short-term counseling (Fiore, et al., 2008).

TQL Components

Fiore, et al., (2008) described the components of the TQL as shown below.

Assessment of readiness to quit: Steps of smoking cessation were explained by Prochaska’s popular Trans-Theoretical Model (TTM) known as stages of behavioral change. This theory consists of 6 non-linear stages a smoker passes through while quitting: pre-contemplation, contemplation, preparation, action, maintenance and relapse (Chouinard, et al., 2007). Determining which of these 6 stages the smoker is in helps assess his or her readiness to quit and provide the necessary aid. In addition, these six stages help identify the appropriate messages and approaches required to motivate the smoker to pass from one stage to the next (Chouinard, et al., 2007).

Program clinicians: involves both medication and counseling strategies.

Program intensity: for best results it is recommended that sessions be at least 10 minutes long and repeated at least 4 times.

Program format: telephone or face-to-face. Telephone-based such as TQL which has been proved effective.

Medication and types of counseling therapy are to be explained elsewhere in this chapter.

Populations: it can be used with all population groups (Fiore, et al., 2008; Cummins, 2007).

Advantages of telephone counseling include: overcoming barriers associated with attending face-to-face behavioral classes. It does not require transportation. It does not take time away from work or children. It is accessible by everybody particularly smokers in rural and underserved areas. In addition, it offers counseling anonymously and respects callers' privacy. Research shows that quit rates are proportional to the intensity of received telephone counseling sessions (Zhu, 2000; Fiore, et al., 2008; Carlini, et al., 2008; Anderson and Zhu, 2007; Cummins, et al., 2007). Proactive counseling helps reduce the attrition rate and also provides follow up counseling calls (Zhu, 2000).

Centralization of state-run TQL offers an opportunity to serve a wide range of population groups at an economical cost (CDC, 2004). TQL has been referred to as the safety net among tobacco cessation strategies because it can continue functioning at low cost, even when other expensive state programs suffer budgetary cuts (CDC, 2004).

Services Provided by the TQL

1. Counseling. This is either reactive or proactive, which differ in intensity and duration. States differ in their policies of the services they provide. In some states like

New York and Illinois, the TQL are mainly operated on a reactive (hotline) basis. They respond to all callers and provide brief services to a high number of callers. On the other hand, the Arizona and Georgia TQL provide their callers with more frequent intensive proactive counseling services. The contact is usually initiated by the callers to the TQL. But then, based on agreement for accountability dates, counselors start to proactively call the smoker for follow up sessions. Some states save proactive counseling for uninsured and high-risk groups, while providing reactive services to the rest of the callers. Several researchers documented the effectiveness of proactive telephone counseling in helping smokers quit (Bentz, et al., 2006; Abdullah, et al., 2004, Zhu, 2000; CDC, 2004; Cummins, et al., 2007; Shmitt, et al., 2007; Anderson & Zhu, 2007). The elite Cochrane Collaboration reviewed the evidence pertaining to TQL and highlighted that TQL counseling is effective in helping smokers quit (Stead, et al., 2006). Counseling or behavioral therapy utilizes the principles of motivation, positive reinforcement, encouragement, problem solving skills, and psychological support (Cummins, et al., 2007).

2. Pharmacotherapy. Some states such as California and Maine provide the qualified callers with pharmacotherapy through TQL.

3. Referral. Some TQL's redirect callers to certain local cessation services. For example in Massachusetts, TQL callers may request to enroll in a face-to-face group counseling class, and the TQL attempts to connect them with such services. Some health plans provide cessation services, and their callers get transferred accordingly.

4. Mailing. Packets of self-help materials are provided to all callers.
5. Websites. TQL provide online information regarding quitting and TQL services in general (CDC, 2004).

Literature on smoking cessation services, and especially TQL, is slowly growing. Several researchers were interested in exploring the utilization rate and the characteristics of callers to national and states' TQL. For example Gilbert, and group (2005) conducted a study to compare the characteristics of callers to the TQL with those in general public using other types of cessation help. Cummins, et al. (2007) compared different components of states' TQL, and concluded that the average utilization of TQL among smokers was about 1% annually. Another example is a California study to determine the proportion of smokers in the general population utilizing smoking cessation aids in order to quit and how successful they are in achieving this goal (Zhu, et al., 2000). The Georgia TQL has been evaluated previously; it was shown to be both satisfying and effective in helping callers quit smoking (Hunt & Hepburn, 2006).

Harwell, et al., (2007) examined the number and characteristics of smokers calling the Montana TQL. In this study the researchers focused on evaluating the effects of a tobacco tax increase in the state in relation to TQL utilization. They concluded that the majority of callers to Montana TQL in the period between 2004-2006 were White, young, females (Harwell, et al., 2007).

In Maine, the TQL's level of utilization and effectiveness were assessed by Swartz and group (2005). They concluded that 92% of the callers were tobacco users.

Only a few (0.9%) tobacco user adolescents called the TQL. In addition, TQL usage varied by educational level. The Maine TQL assessment highlighted the importance of providing callers with both counseling and pharmacological therapy to increase the likelihood of quitting success (Swartz, et al., 2005). Also, they emphasized that the TQL had not yet maximized its impact.

Besides states TQL, the characteristics and tobacco quitting rates of a sample of smokers who called the American Cancer Society (ACS) toll free help line were examined (Rabius, et al., 2004). The eligible population included adults wishing to quit within 2 weeks. After randomization, counselors provided the intervention group five sessions of tailored motivational telephone counseling. The study participants received positive reinforcement, encouragement, guidance, and emotional support. Racial differences in smoking and cessation aids utilization habits intrigued researchers.

Cokkinides, and colleagues (2008) utilized 2005 National Health Interview Survey (NHIS) data to assess racial and ethnic differences regarding smoking and use of cessation aids. The study concluded that there were significant differences among racial groups regarding their socio-demographic characteristics, smoking and cessation behaviors. LaVeist, et al. (2007) observed that Black smokers commonly reported smoking less than one pack a day, while White people smoked heavier. The same authors did not find racial differences in the smoking intensity when NHIS was analyzed.

Andoh, et al. (2008) conducted a study to evaluate the gender and racial differences among smokers who called a national TQL. They found that women smokers

were less educated, and lighter smokers. However, they expressed higher vulnerability to environmental stimuli to smoke after deciding to stop when compared with men smokers. Moreover, women tried more ways to quit smoking than men (Andoh, et al., 2008).

Georgia Tobacco Quit Line

The Georgia Tobacco Use Prevention Program (TUPP) follows the recommendations of the comprehensive tobacco control program designed by the Center for Disease Control and Prevention (CDC), Office of Smoking and Health. TUPP is striving to decrease the rates of death and disease related to tobacco in Georgia through the following: preventing tobacco use; promoting quitting; addressing second-hand smoke; and identifying and eliminating disparities related to tobacco use (Hunt & Hepburn, 2006).

The TUPP's major goal is to help smokers quit through implementing several interventions such as telephone counseling. The Georgia TQL began operation in November, 2001. The quit line counseling service is provided by Free and Clear, Inc. The Georgia Department of Health and Human Resources, Division of Public Health funds the program via the Master Tobacco Settlement money (Anderson & Zhu, 2007).

The Georgia TQL provides the following services:

Tobacco users are provided with:

- Needs assessment and evaluation of readiness to quit, this step is important to enable the counselor or the coach to tailor the specific needs of the callers accordingly (Gilbert, et al., 2005).

- Cessation intervention services (i.e. the provision of the counseling sessions).
- Quit kit, self-help material to all smokers.
- Referral services and face-to-face cessation services.
- Information regarding pharmacotherapy.

Health care providers are provided with:

- Cessation aid information.
- Referral and follow up on progress of smoker patients.

Friends and family are provided with:

- Information regarding smoking and quitting on behalf of others (Hunt & Hepburn, 2006).

An adult tobacco user calling Georgia TQL would receive one or more of the following intervention strategies “*Standard Intervention*”:

- Smoking and medical history assessment: questions evaluating type and amount of tobacco smoked, tobacco-related illness, motivation and readiness to quit.
- Guidance: thorough explanation of available quitting options including types of medications or behavioral motivational therapy strategies.
- Referral to other services upon request.
- Mailing the quit kit.
- Discussion of potential benefits of quitting provided by their health plans.
- Provision of intensive phone counseling services for eligible callers.
- Help in deciding on a quit date (Anderson & Zhu, 2007; Cummins, et al., 2007).

Basic follow up

This intervention offers callers two proactive calls from the counselors. The first one is to be made on the pre-determined quit date and the second shortly afterwards. Pregnant, recently quit, and those willing to quit within 30 days are eligible to enroll in the intensive counseling intervention. This program offers four proactive calls to provide continuous support and answer questions of the quitting smokers. In addition, Georgia TQL provides a specially designed intervention program for youth aged 13-17 years (Hunt & Hepburn, 2006).

CHAPTER III

METHODS & PROCEDURES

Data Source

This is a cross sectional study using data from the Georgia Tobacco Quit Line (TQL) survey, which generated 9,484 valid calls during the time period from October 2005 to April 2007. Callers to the TQL fell into three categories: (1) health care providers (3.3%), the general public (13.1%), (2) family and friends of tobacco users (5.3%) and (3) tobacco users (7,426, 78%). Any caller reported using cigarettes, cigars, pipes, or smokeless tobacco was classified as a tobacco user. Specifically this study is based upon the analysis of data reported by “cigarette smokers” the rest of callers were excluded, as were callers from outside the state of Georgia based on their zip codes.

Study Variables

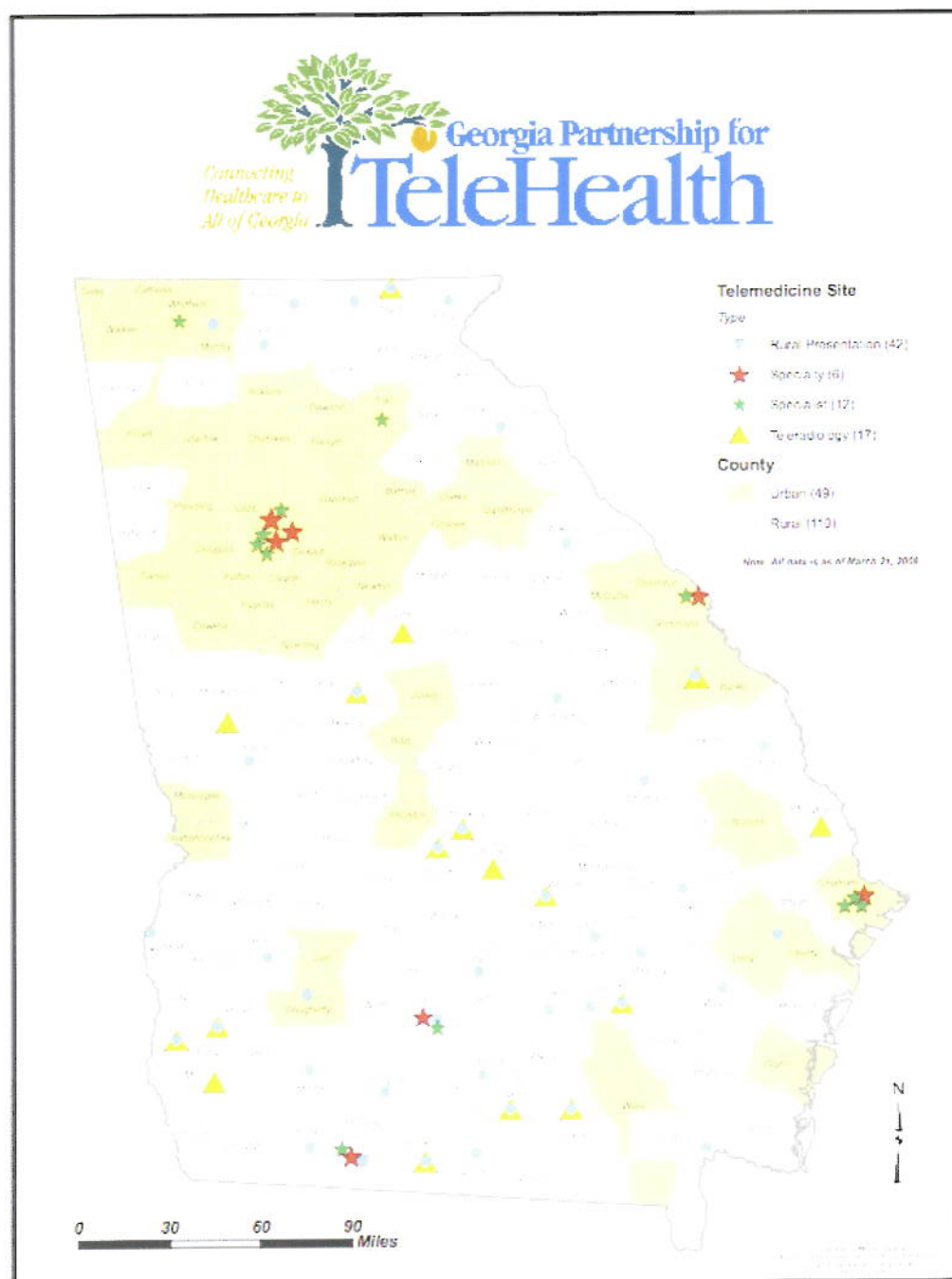
During the study period of October 2005-April 2007 smokers called the Georgia TQL were registered as callers. Some of tried to quit with the help of the TQL counseling services more than once. A caller to the Georgia TQL is given a specific identification number and considered a new caller when he or she seeks help for the first time. During the first call, demographic information is reported. The caller is considered recurrent or enrolled during the follow up calls. Due to the addictive ability of nicotine relapse in quitting is expected leading smokers to seek help again. Therefore some of the callers called more than once over the study period.

The demographics of age, gender, educational attainment, race, and residence were thoroughly examined. To evaluate the population reach of the TQL, gender and

geographical distribution of smoker callers were compared to those of smokers in the general population in the state of Georgia (see Appendix B).

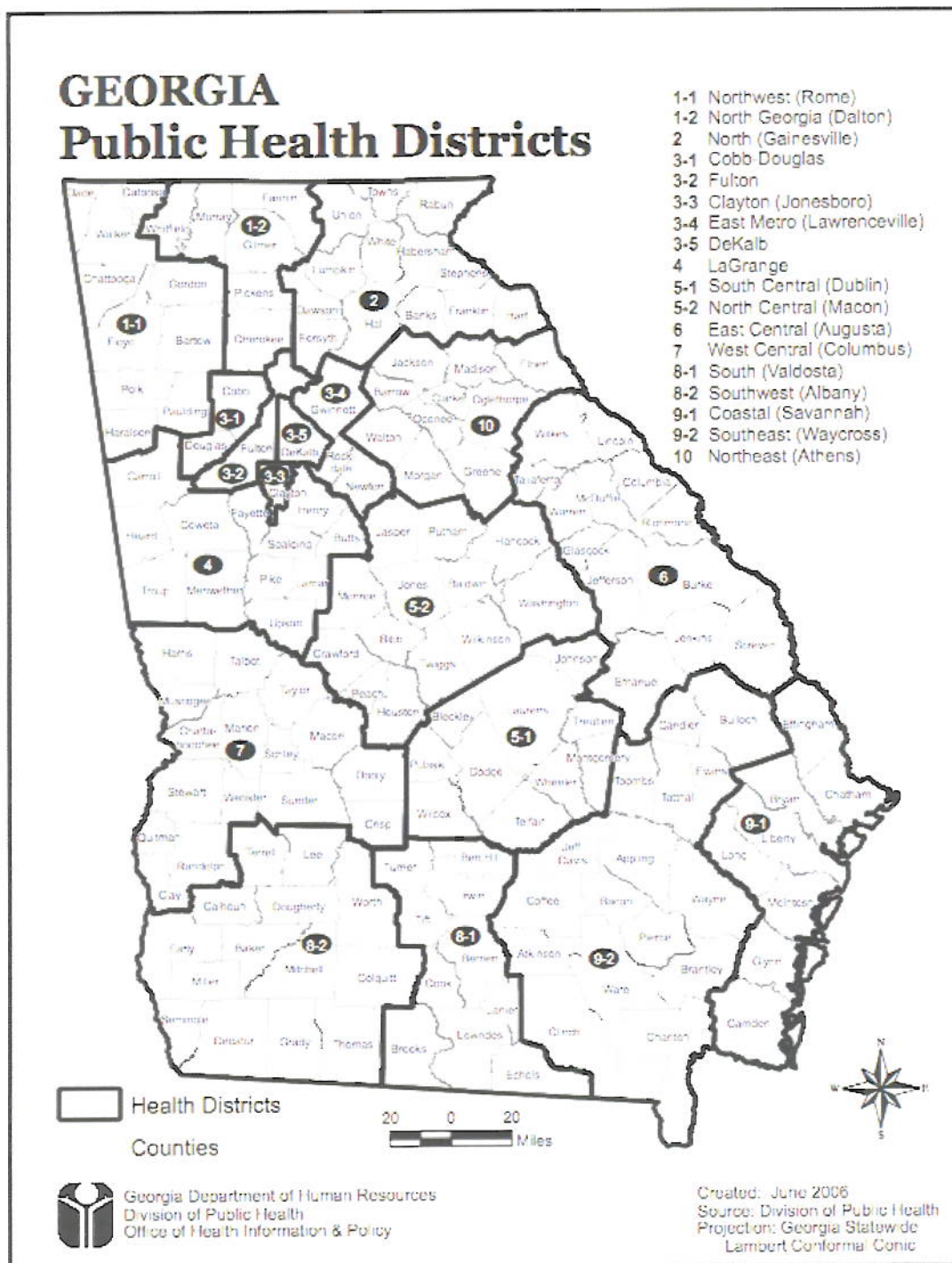
A variable was created to assign tobacco user callers to either urban or rural residence settings. The map that was selected for this purpose exclusively designated counties as urban or rural (Grajeda, 2008). The Georgia Department of Community Health designated 110 counties as rural ones according to the following criteria: counties with a population of 35,000 or less; counties considered as rural by the state or the federal law; and counties designated as rural by the state office of rural health (Georgia Department of Community Health, 2007). In addition, the used map was initially created to describe telehealth and the distribution of specialty medical services across the state of Georgia (map 3.1).

Map 3.1: Rural and Urban Georgia Counties.



The state of Georgia is divided into 18 public health districts. These health districts consist of several counties. Using the map of the Georgia Public Health Districts (Georgia Department of Human Resources, 2006) the counties were clustered into 18 groups representing Georgia public health districts (map 3.2). Thereafter, the study subjects were divided into rural or urban residents and distributed into Georgia's 18 public health districts.

Map 3.2 Georgia Public Health Districts



Race was another important variable to be considered. Smokers were divided into three groups: white, black, and others. All three racial groups were included when general descriptions regarding different variables were made. The total number of study participants consisted of 5,371 smokers. However, to allow for white and black comparison with respect to different variables, the third racial groups group (others) was excluded occasionally from analysis. Data among “cigarette smokers” who were included in the analysis were organized around two demographic variables: (1) urban/rural. (2) race: white, black, and others.

The study participants were (5,371 callers) smokers who consistently provided the TQL registry with information regarding their race and residential setting, and hence their records did not contain missing data for their variables (figure 1).

Initially, study participants were divided into three groups by age: youth (13-17 years), adults (18-69 years), and seniors (70 years and older). Data for the “youth” and “senior” groups were entered as a single category. Because of the wide age range, the “adult” group was sub-divided into the following sub categories: 18-24, 25-35, 36-46, 47-69 years. White and black mean adult ages were calculated and compared.

A small number of callers to the Georgia TQL during the study period reported specific quit dates, which represented their last days to use tobacco. When assessing the smoking history those callers were considered former smokers and thus excluded. The rest were active or “current smokers”(5,163 active smokers) their characteristics and smoking history and habits were further examined.

Smoking history: Smoking status among active smokers was divided into three categories: (1) “light” (< 20 cigarettes a day), (2) “moderate” (20-40 cigarettes a day) and

(3) “heavy” (>40 cigarettes a day) based on smokers’ response to the number of cigarettes they smoked per day. Similar classification of smokers was used by (Chiolero, et al., 2008).

Duration of smoking was calculated by subtracting the registered age of the callers from the reported smoking start age. A new variable called smoking pack years was estimated using the following formula:

Number of cigarettes smoked per day divided by 20 (as the total number of cigarettes per pack), multiplied by the number smoking years.

Smoking pack years is a rough estimate of the tobacco dose a person is exposed to over years of smoking. It is mainly used to assess the dose response effects of smoking on different health problems such as heart diseases and cancers (Gram, et al, 2008; Polosa, et al., 2008). Mean smoking pack years was calculated and compared across different racial groups. Smoking pack years was divided into 5 categories: ≤ 10 , 11-25, 26-45, 46-95, and >95 . Polosa, et al. (2008), Gram et al. (2008), and Setty, et al. (2007) used different smoking pack years categories. Their categories could not be followed in this study because of the wider range of values found in the current study.

The percentage of smokers called the Georgia TQL out of all the smokers in Georgia public health districts were estimated. Georgia adult Behavioral Risk Factor Surveillance System BRFSS (2006) data were used to estimate the percentage of adult smokers in the different Georgia public health districts (Bryan & Thompson, 2007). Unfortunately, the actual numbers of smokers in Georgia health districts were not readily available in the same data set. The U.S Census Bureau website was used to assess the adult population size in each of Georgia counties (U.S. Census Bureau, 2007). Then, the

estimated populations of Georgia counties were added together to estimate the population size at the district level. Using Georgia BRFSS (2006) data set, the actual numbers of smokers at the district level were estimated. During the 18 months of the data collection, the rates of callers per 1000 smokers in Georgia 18 Public Health Districts were calculated. In addition, the annual rate of calls received by the Georgia TQL was estimated.

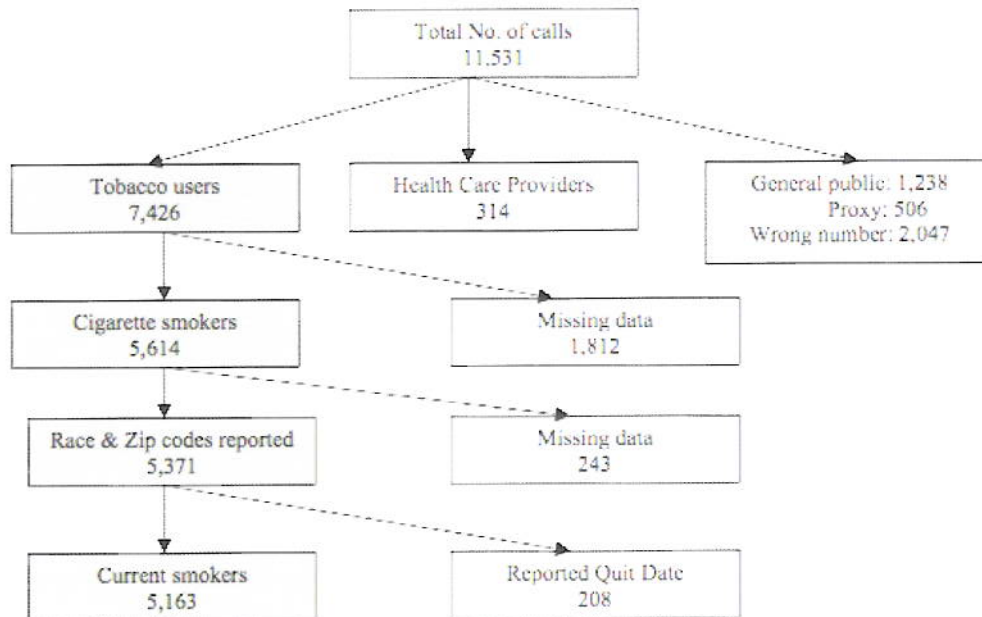
Statistical analysis

Using SPSS 13.0 (Chicago, IL), descriptive analysis of the characteristics of smokers calling the TQL was conducted. Variables of interest like age, smoking pack-years, and smoking intensity were categorized into groups. Pearson chi square and T tests were used to compare categorical and continuous variables respectively. A P value of 0.05 was considered statistically significant. Epi Info 5.3 was used to calculate relative risk and to assess statistical significance.

Some variables were analyzed as categorical variables such as age, gender, race, residence type, how they heard about the quit line, districts, smoking pack years, having chronic disease(s). Other variables, including adult age in years and duration of smoking were analyzed as continuous variables.

Figure 3.1 depicts the inclusion and exclusion criteria of the study the study participants according to their smoking history and available data. The Shaded boxes demonstrate the number of tobacco users who called the Georgia TQL and those who were excluded for missing data.

Figure 3.1: Selection of Study Participants



CHAPTER IV RESULTS

This study included 5,371 smokers who called the Georgia TQL in the period of October, 2005-April, 2007. The general descriptive characteristics of these callers are illustrated in table 4.1. Six of every 10 callers were white (58.9%), while black callers constituted (33.0%) of the study population and the remainder were classified as Others. The majority (72%) of calls were from urban areas. In addition, more than half (58.3%) the study population were female. The adult minimum age of smoker callers was 18 years, while the maximum was age 69. The mean age of adult callers was 40.82 years \pm 13.112 SD.

Table 4.1: Description of the General Characteristics of the Study Population

Race	No.	Percent
White	3166	58.9
Black	1775	33.0
Others	430	8.0
Total	5371	100.0
Residency		
Urban	3866	72.0
Rural	1505	28.0
Total	5371	100.0
Gender		
Female	3129	58.3
Male	2240	41.7
Total	5369	100.0

The results of this study showed that white (59.2%) and black (58.7%) female smokers were more likely to call than males. Yet, the difference was not statistically significant (table 4.2).

Table 4.2: Gender Distribution of Smoker Callers to the Georgia TQL According to Race

Gender	White		Black		Total	
	No.	%	No.	%	No.	%
Male	1291	40.8	733	41.3	2024	41.0
Female	1874	59.2	1042	58.7	2916	59.0
Total	3165	100.0	1775	100.0	4940	100.0

P > 0.05

The prevalence of smoking among males (22.4%) is higher than that among females (17.6%) in the state of Georgia. Table 4.3 shows the distribution of male and female smokers in Georgia according to the 2006 BRFSS report and the rates for callers to the TQL per 1000 smokers. Females were nearly twice likely to call than males (RR=1.72; 95% C.I. 1.63-1.81). The study showed that the rate of utilization of the Georgia TQL by smokers was very low, less than one per cent. The annual rate of calls was 2.6 per 1000 smokers.

Table 4.3: Gender Distribution of Adult Callers and Smokers in Georgia

Gender	Population size	*Smoking %	Smokers No.	Callers No.	**Rate of callers per 1000 smokers
Male	3,273,304	22.4	733,220	2,171	2.9
Female	3,426,891	17.6	603,132	3,067	5.0
Total	6,700,195	19.9	1,336,352	5,238	3.9

* The percent is derived from the number of smokers divided by the total number of gender specific population. The rest of males and females were not smokers.

** The difference between the rates of male and female callers was significant, P<0.0001.

Figure 4.1 demonstrates that Georgia TQL received only 2.9 and 5.0 calls per 1000 male and female smokers, respectively.

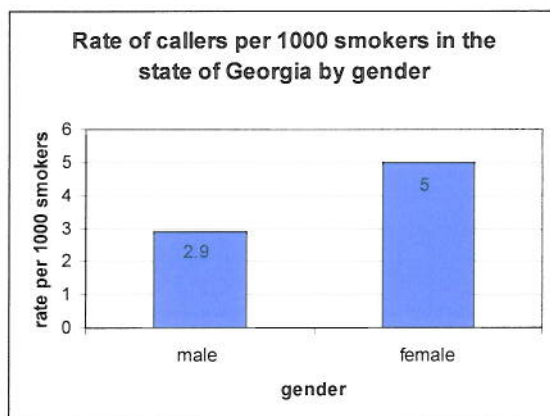


Figure 4.1: Rate of Callers per 1000 Smokers by Gender

Table 4.4 depicts that 59.4% of urban callers and 75.8% of rural callers were white. The differences within the group distribution in table 4.4 were statistically significant ($P < 0.0001$). Figure 4.2 demonstrates the distribution of callers according to race and residence.

Table 4.4a: Distribution of Smoker Callers to the Georgia TQL According to Race and Residential Setting

Race	Residential setting				Total	
	Urban		Rural			
	No.	%	No.	%	No.	%
White	2091	59.4	1075	75.8	3166	64.1
Black	1432	40.6	343	24.2	1775	35.9
Total	3523	100.0	1418	100.0	4941	100.0

$P < 0.0001$

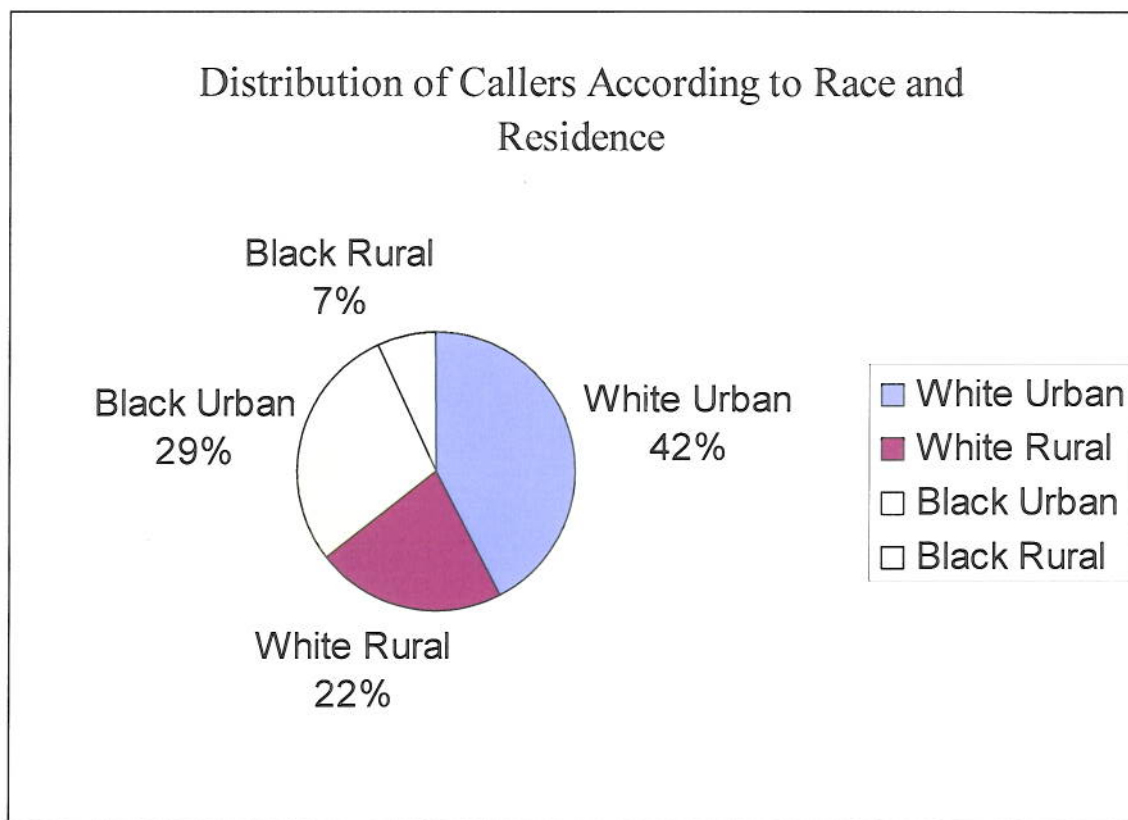


Figure 4.2: Distribution of Callers by Race and Residence

Table 4.4b demonstrates the racial distribution of the smoking population in the state of Georgia. According to the 2006 BRFSS report, 20.8% of white people reported that they smoked compared to 16% of the black population in the state. Black smokers (6.27 per 1000) were nearly twice (RR=1.72; 95% C.I. 1.62-1.82) likely to call than white smokers (3.65 per 1000).

Table 4.4b: Racial Distribution of Adult Smokers in Georgia

Race	Adult population size	Smoking %	Smoking No.	Callers No.	**Rate of Callers per1000
White	4,052,739	20.8	842,970	3,082	3.65
Black	1,759,053	15.9	279,689	1,754	6.27
Total	5,811,792*	19.9	1,122,659	4,836	4.3

* The total does not represent all the adult population in Georgia

** The difference in rates was statistically significant, $P < 0.0001$

The mean adult age among both white callers (40.45 yr) and Black callers (40.71 yr) was similar, as demonstrated in table 4.5.

Table 4.5: Mean Age Differences Between Adult Black and White Smokers Who Called the Georgia TQL during the Study Period

Race	No.*	Mean age (years)	SD
White	3084	40.45	13.92
Black	1746	40.71	12.87

P>0.05

* Young (13-17 years) and senior people (70 years +) were excluded from this group.

Table 4.6 shows the educational attainment of callers by gender. Statistically significant (P<0.05) differences were observed in the education levels among males and females who called the Georgia TQL. One in every three male (33.4%) and female (34.7%) callers had a GED or high school degree. More females (18.7%) reported having less than high school degrees as compared to males (14.7%).

Table 4.6: Distribution of Educational Attainment According to Gender

Education	Females		Males		Total	
	No.	%	No.	%	No.	%
Grade 9-11 (no degree)	542	18.7	303	14.7	845	17.0
GED/High school	1005	34.7	809	33.4	1814	36.5
Some college	857	29.6	580	28.1	1437	28.9
College & more	496	17.1	373	18.1	869	17.5
Total	2900	100	2065	100	4965	100

P < 0.05

Black smokers were significantly different from white smokers in terms of educational levels. Blacks (38.9%) more often reported having only a GED or high school degree than white (35.8%) callers. On the other hand, white smokers were 1.19 times more likely (RR=1.19; 95% C.I. 1.04-1.36) to have a college degree or more

(18.4%) than black smokers (15.4%), as shown in table 4.7.

Table 4.7: Distribution of Educational Attainment of Callers according to Race

Education	Race					
	White		Black		Total	
	No.	%	No.	%	No.	%
9-11 Grade (no degree)	505	17.3	287	17.0	792	17.2
GED/High school	1045	35.8	658	38.9	1703	37.0
Some college	831	28.5	485	28.7	1316	28.6
*College degree +	536	18.4	261	15.4	797	17.3
Total	2917	100.0	1691	100.0	4608	100.0

*P < 0.05

Table 4.8 shows the distribution of educational attainment among White smokers from rural and urban areas. The majority of white callers from urban areas had at least a high school or GED. Very few urban whites (14.5%), compared to rural Whites (23%) did not finish high school. Compared to urban white callers (20.8%), rural white callers (13.5%) were less likely (RR 1.54; 95% C.I. 1.28-1.85) to have a college degree or more as demonstrated in table 4.8.

Table 4.8: White Educational Attainment Distributed According to Residential Setting

Educational attainment	Residential setting					
	Urban		Rural		Total	
	No.	%	No.	%	No.	%
9-11 G	282	14.5	223	23.0	505	17.3
GED/High school	674	34.6	371	38.2	1045	35.8
Some college	586	30.1	245	25.3	831	28.5
*College degree +	405	20.8	131	13.5	536	18.4
Total	1947	100.0	970	100.0	2917	100.0

*P<0.0001

Table 4.9 presents the distribution of educational attainment among black callers according to residence. The majority (44.6%) of rural black smokers reported having a high school degree or GED. In general, urban resident callers were 2.17 times more likely to have a college degree or more (RR=2.17; 95% C.I. 1.46-3.22).

Table 4.9: Black Educational Attainment Distributed According to Residential Setting

Educational attainment	Urban		Rural		Total	
	No.	%	No.	%	No.	%
9-11 Grade	209	15.2	78	24.7	287	17.0
GED/High School	517	37.6	141	44.6	658	38.9
Some college	413	30.0	72	22.8	485	28.7
*College degree +	236	17.2	25	7.9	261	15.4
Total	1375	100.0	316	100.0	1691	100.0

*P<0.0001

Figure 4.3 graphically demonstrates the age distribution of callers to the TQL. The majority of callers were in the older adult age groups, aged 47-69 years (34.5%). Very few young (13-17 years) (2.1%) and senior (70 years +) (2.2%) smokers called the TQL for help to quit smoking.

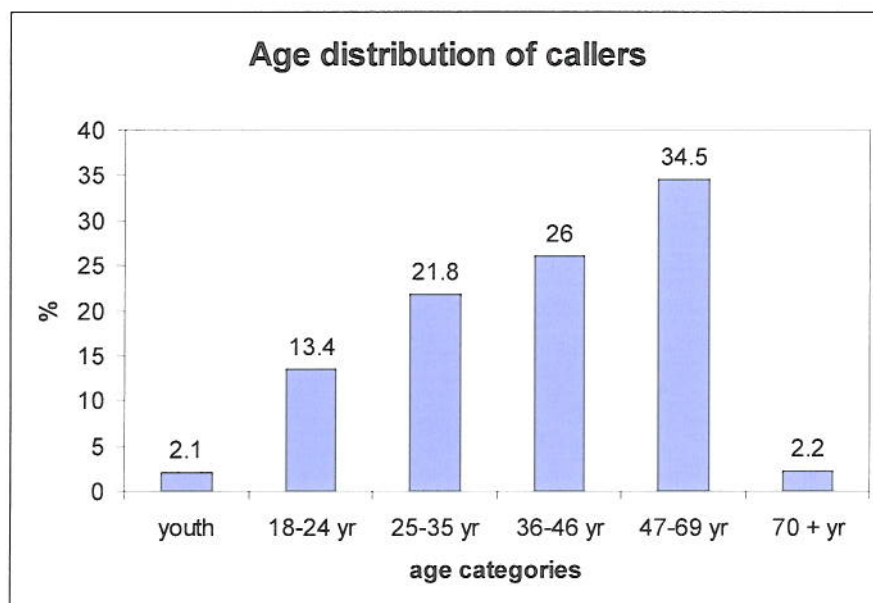


Figure 4.3: Age distribution of callers

Table 4.10 illustrates the distribution of callers according to age and race. Among those who aged 36-46, they were more likely to be black (28.6%) than white smokers (24.7%), yet the difference is not large.

Table 4.10: Distribution of Callers according to Race and Age Groups

Age categories	Race				Total	
	White		Black		No.	%
	No.	%	No.	%		
Young people	80	2.5	11	0.6	91	1.8
18-24 yr	433	13.7	207	11.7	640	13.0
25-35 yr	667	21.1	383	21.7	1050	21.3
36-46 yr	781	24.7	505	28.6	1286	26.1
47-69 yr	1119	35.3	630	35.7	1749	35.5
70 yr and more	82	2.6	29	1.6	111	2.3
Total	3162	100.0	1765	100.0	4927	100.0

P<0.0001

The distribution of the study population into Georgia Public Health Districts is illustrated in table 4.11. The highest percentages of calls were from Fulton (11.4%) and LaGrange (9.1%) public health districts. On the other hand, the least numbers of calls were from Dublin (1.8%) and Clayton (2.3%). Further, there were significant variations in the racial distribution of callers from the 18 Georgia public health districts. Appendix (A) demonstrates the number of calls at the county level.

Table 4.11: Distribution of Callers according to Georgia Public Health Districts

District	No.	%
Northwest (Rome)	372	6.9
North Georgia (Dalton)	245	4.6
North (Gainesville)	312	5.8
Cobb-Douglas	379	7.1
Fulton	610	11.4
Clayton (Jonesboro)	124	2.3
East Metro (Lawrenceville)	340	6.3
DeKalb	418	7.8
LaGrange	488	9.1
South Central (Dublin)	97	1.8
North Central (Macon)	267	5.0
East Central (Augusta)	289	5.4
West Central (Columbus)	249	4.6
South (Valdosta)	173	3.2
South West (Albany)	220	4.1
Coastal (Savannah)	320	6.0
South East (Waycross)	261	4.9
North East (Athens)	207	3.9
Total	5,371	100.0

Table 4.12 demonstrates that almost 70% of callers from the Fulton public health district were black and only 30% of them were white.

Table 4.12: Distribution of Callers according to Race and Public Health Districts

Public health districts	Race				Total
	White		Black		
	No.	%	No.	%	
Northwest (Rome)	323	91.5	30	8.5	353
North Georgia (Dalton)	216	96.0	9	4.0	225
North (Gainsville)	266	92.4	22	7.6	288
Cobb-Douglas	223	64.3	124	35.7	347
Fulton	171	30.8	384	69.2	555
Clayton (Jonsboro)	40	35.1	74	64.9	114
East Metro (Lawrenceville)	202	69.7	88	30.3	290
DeKalb	115	30.9	257	69.1	372
LaGrange	344	74.8	116	25.2	460
South Central (Dublin)	70	76.9	21	23.1	91
North Central (Macon)	146	60.1	97	39.9	243
East Central (Augusta)	146	54.7	121	45.3	267
West Central (Columbus)	123	51.9	114	48.1	237
South (Valdosta)	108	66.3	55	33.7	163
Southwest (Albany)	126	60.3	83	39.7	209
Coastal (Savannah)	207	70.9	85	29.1	292
Southeast (Waycross)	194	80.5	47	19.5	241
Northeast (Athens)	146	75.3	48	24.7	194
Total $P<0.0001$	3,166	64.1	1,775	35.9	4,941

Table 4.13 shows the adult population size in Georgia public health districts; number and percent of smokers; and the number and rate of callers per 1000 smokers. Over 18 months, only about 4 per 1000 smokers in the state of Georgia called the TQL. Fulton public health district has the highest adult population size (717,126) with only 15.5% of them being smokers and 5.4 per 1000 of them called the TQL during the study period. On the other hand, the smoking prevalence in Northwest (27.6%) is higher than the state overall prevalence (19.9%) and merely 3.9 per 1000 of smokers in this district called the TQL seeking help.

Table 4.13: Callers and Smoking Prevalence in Georgia Public Health Districts

Georgia		*Adult Population (Size) No.	**Adults Smokers %	Adult Smokers No.	Adult Callers No.	Rate/1000 smokers
Total		6,700,195	19.9	1,333,338	5,240	3.9
Health Districts						
1-1	Northwest (Rome)	442,969	27.6	122,259	362	2.9
1-2	North Georgia (Dalton)	299,541	25.0	74,885	237	3.1
2	North (Gainesville)	82,101	22.1	18,144	301	16.5
3-1	Cobb/Douglas	586,781	16.1	94,471	372	3.9
3-2	Fulton	717,126	15.5	111,154	607	5.4
3-3	Clayton	188,596	26.2	49,412	121	2.4
3-4	East Metro (Lawrenceville)	667,259	16.7	111,432	336	3.0
3-5	DeKalb	540,530	14.5	78,367	409	5.2
4	LaGrange	574,539	21.0	120,653	468	3.8
5-1	South Central (Dublin)	109,369	22.4	24,498	95	3.8
5-2	North Central (Macon)	374,003	24.1	90,134	258	2.8
6	East Central (Augusta)	309,191	22.3	68,949	281	4.0
7	West Central (Columbus)	260,289	24.4	63,510	246	3.8
8-1	South (Valdosta)	175,466	25.6	44,919	170	3.7
8-2	Southwest (Albany)	268,267	21.8	58,482	214	3.6
9-1	Coastal (Savannah)	351,099	24.3	85,317	311	3.6
9-2	Southwest (Waycross)	256,598	24.5	62,866	251	3.9
10	Northeast (Athens)	325,050	20.7	67,285	201	2.9

* U.S. census bureau.

** Georgia BRFSS (2006)

Regarding chronic diseases among smoker callers to the TQL, table 4.14 demonstrates the frequency distribution of the various reported types of chronic diseases among smokers. First on the list of chronic diseases cited by callers was chronic asthma (15%), followed by chronic COPD (10.2%).

Table 4.14: Distribution of Types of Chronic Diseases among Callers

Chronic disease	No.	%
Chronic asthma	831	15.5
Chronic Diabetes	576	10.7
Chronic COPD	548	10.2
Chronic CAD	353	6.6

Distribution of “Chronic-Disease -Score” is depicted in table 4.15. Fortunately, about 70% of the callers are thinking of quitting while they are still disease-free. Note that the number of callers with no chronic disease was greater than those with one or more chronic diseases.

Table 4.15: Distribution of Chronic Disease Score among Callers

Chronic disease score	No.	%
No chronic disease	3,711	69.1
One chronic disease	1,194	22.2
Two chronic diseases	328	6.1
Three or four chronic disease	138	2.6
Total	5,371	100

Table 4.16 shows that 66.7%, and 71.8% of both white and black callers had no known chronic diseases when they called the TQL. White callers were 1.72 times more likely to have two or more chronic diseases than black callers (RR= 1.72; 95% C.I. 1.39-2.12, P<0.0001).

Table 4.16: Distribution of Chronic Diseases by Race

Chronic disease score	Race					
	White		Black		Total	
	No.	%	No.	%	No.	%
*No chronic disease	2,113	66.7	1,274	71.8	3,387	65.8
One chronic disease	727	23.0	395	22.3	1,122	22.7
Two chronic diseases	228	7.2	74	4.2	302	6.1
Three or four chronic diseases	98	3.1	32	1.8	130	2.6
Total	3,166	100.0	1,775	100.0	4,941	100.0

* P>0.05

White callers were more likely to have multiple chronic diseases than black callers. Compared to black callers (6%), more white callers (10.3%) reported having two or more chronic diseases. This is depicted in both table 4.16 and figure 4.4.

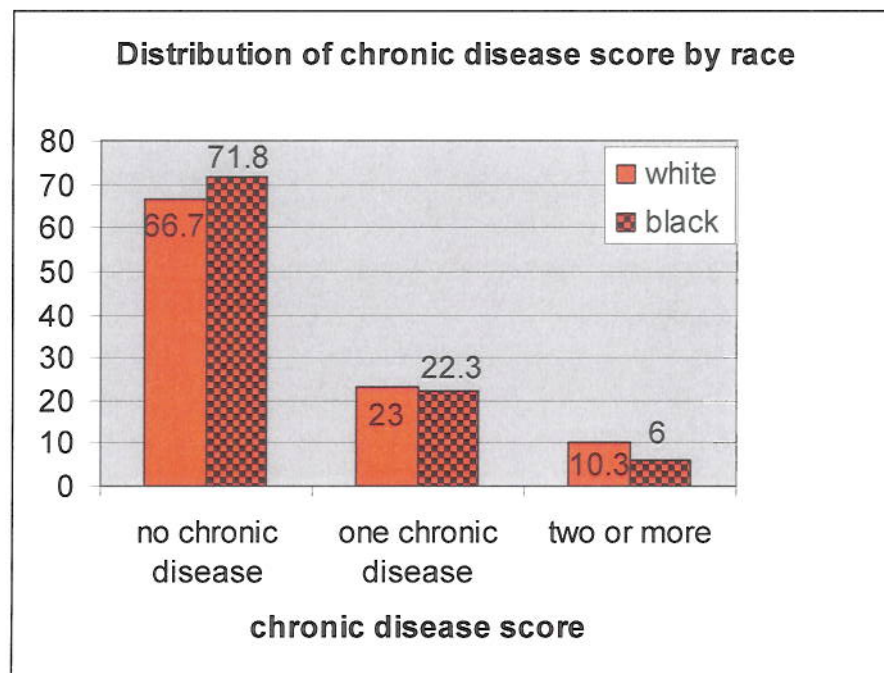


Figure 4.4: Distribution of Chronic Disease Score by Race

Table 4.17 demonstrates the distribution of methods by which callers of both races have heard about the TQL. Black smokers were 32% more likely to report T.V. as the way they heard about the Georgia TQL than white callers (RR=1.32; 95% C.I. 1.18-1.46). The second most commonly mentioned way was health care professionals (21.8%). There was no significant difference between white and black smokers regarding hearing about the TQL from health care professionals (RR=1.18; 95% C.I. 1.00-1.41).

Table 4.17: Distribution of Methods by Which Callers Heard About TQL by Race

Methods	Race					
	White		Black		Total	
	No.	%	No.	%	No.	%
*TV	498	34.1	348	44.9	846	37.9
Radio	32	2.2	12	1.5	44	2.0
Family and friends	113	7.7	35	4.5	148	6.6
Print media	166	11.4	86	11.1	252	11.3
**Health care professionals	337	23.1	151	19.5	488	21.8
Websites	47	2.2	11	2.2	58	2.4
TQL (recurrent callers)	25	1.7	14	1.8	39	1.7
Billboards	36	2.5	17	2.2	53	2.4
Others e.g.phone directory	206	14.1	101	13.0	307	13.7
Total	1,460	100.0	775	100.0	2,235	100

*P < 0.0001

** P=0.05

Table 4.18 demonstrates the distribution of methods black and white callers heard about the TQL in urban and rural areas. Among black smokers, urban callers were 1.32 times more likely to hear about the TQL through TV than rural callers (RR=1.32; 95% C.I. 1.15-1.82, P<0.001). Among white smokers, there was no significant difference between urban and rural callers with respect to TV (RR=1.14; 95% C.I. 0.98-1.33, P>0.05). Regarding health care professionals, table 4.18 shows the following: among black callers health care providers advised rural smokers 1.44 times more than urban

smokers (RR=1.44; 95% C.I. 1.06-1.96, P<0.05). Among white smokers, health care providers advised rural smokers to contact the TQL 1.59 times more than urban smokers (RR=1.59; 95% C.I. 1.32-1.91, P<0.0001).

Table 4.18: Distribution of Methods through Which Callers Heard About TQL by Race and Residential Setting

Methods	Urban		Rural		Total	
	No.	%	No.	%	No.	%
BLACK						
*T.V.	292	48.1	56	33.3	348	44.9
Radio	7	1.2	5	3.0	12	1.5
Family & Friends	29	4.8	6	3.6	35	4.5
Print media	65	10.7	21	12.5	86	11.1
*Health care professionals	108	17.8	43	25.6	151	19.5
Website	11	1.8	0	0	11	1.4
Recurrent caller	9	1.5	5	3.0	14	1.8
Billboards	14	2.3	3	1.8	17	2.2
Others	72	11.9	29	17.3	101	13.0
Total	607	100.0	168	100.0	775	100.0
WHITE						
T.V.	332	35.7	166	31.3	498	34.1
Radio	23	2.5	9	1.7	32	2.2
Family & Friends	84	9.0	29	5.5	113	7.7
Print media	95	10.2	71	13.4	166	11.4
*Health care professionals	177	19.0	160	30.2	337	23.1
Website	25	2.7	22	4.2	47	3.2
Recurrent caller	19	2.0	6	1.1	25	1.7
Billboards	29	3.1	7	1.3	36	2.5
Others	146	15.7	60	11.3	206	14.1
Total	930	100.0	530	100.0	1460	100.0

*P <0.05

Table 4.19 demonstrates the frequency distribution of types of TQL services requested by callers. Almost all the smoker callers (93.8%) to the TQL requested

intervention to help them quit. Only a few of the callers (6.0%) requested self help materials only.

Table 4.19: Services Requested by Tobacco User Callers of the TQL

Service types	No.	%
General Questions	10	0.2
Intervention	5037	93.8
Materials only	324	6.0
Total	5,371	100.0

Some of the smokers reported that they had already started their quitting journey, and documented their quit date. Accordingly they were called “*Quit recently*.” Ninety six percent of the smoker callers were still struggling with smoking and were called “*current smokers*”. Table 4.20 shows the current smoking status of callers and demonstrates that only a few of them (4%) had already stopped smoking for a day or more.

Table 4.20: Current Smoking Status of Callers

Smoking status	No.	%
<i>Current smokers</i>	5163	96.1
Quit recently	208	3.9
Total	5,371	100.0

White smokers reported first smoking at a younger age (16.47 years) than Black smokers (18.04 years). This difference was highly significant ($P < 0.0001$) as demonstrated in table 4.21.

Table 4.21: Distribution of Mean Smoking Start Age by Race

Race	No.	Mean start age (yr)	SD
White	1406	16.47	5.23
Black	759	18.04	5.33

$P < 0.0001$

Rural callers reported initial smoking at younger ages when compared to urban callers. As demonstrated in table 4.22, the mean starting age to smoke among rural residents (16.54 years) was significantly less than that observed among urban residents (17.15 years).

Table 4.22: Distribution of Mean Smoking Start Age by Residential Setting

Residence	No.	Mean start age (yr)	SD
Urban	1658	17.15	5.25
Rural	707	16.54	5.54

P<0.05

Table 4.23 reveals the distribution of the mean starting age to smoke among callers to the TQL according to race and residence. Both rural whites and blacks started smoking earlier than their urban counterparts, yet the difference was significant among whites only.

Table 4.23: Distribution of Mean Smoking Start Age According to Race and Residence among Callers of the TQL.

Race	Residential setting	No.	Mean Start Age (Yr)	SD
*White	Urban	894	16.62	5.08
	Rural	512	16.03	5.47
**Black	Urban	596	17.97	5.24
	Rural	163	18.30	5.66

*P<0.05

** P > 0.05

Current smokers' detailed smoking habits were examined and depicted in table 4.24. The majority of the current smokers (96%) smoked everyday. Compared to Whites (2.8%), more Blacks (6.0%) reported smoking some days rather than every day.

Table 4.24: Distribution of Cigarette Using Habits of Current Smokers by Race

Smoking frequency	White		Black		Total	
	No.	%	No.	%	No.	%
Smoke everyday	2,877	97.2	1,603	94.0	4,480	96.0
Smoke some days	82	2.8	103	6.0	185	4.0
Total	2,959	100.0	1,706	100.0	4,665	100.0

P<0.0001

Blacks smoked significantly ($P<0.0001$) fewer cigarettes per day than their White counterparts. This is observed in table 4.25 where 70% of blacks compared to 46.6% whites were light smokers, i.e. smoked less than 20 cigarettes a day. In contrast, half of White (50%) than black (28.9%) smokers reported being heavier smokers and smoked 20-40 cigarettes a day.

Table 4.25: Frequency Distribution of Cigarettes Smoked Per Day among Current Smokers by Race

No. of cigarettes	White		Black		Total	
	No.	%	No.	%	No.	%
Light <20	1408	46.6	1214	70.2	2622	55.2
Moderate 20-40	1509	50.0	500	28.9	2009	42.3
Heavy >40	103	3.4	15	0.9	118	2.5
Total	3020	100.0	1729	100.0	4749	100.0

P<0.0001

The average number of cigarettes smoked per day among black current smokers was significantly less than that smoked by their white counterparts. Table 4.26 shows the results of the T test analysis conducted to compare two independent means. Blacks, on average, smoke 14.28 cigarettes per day while whites are heavier smokers consuming an average of 21.16 cigarettes per day.

Table 4.26: Average Number of Cigarettes Smoked Per Day by Race

Cigarettes smoked per day	White	Black
Number of smokers	2563	1425
Mean cigarettes smoked per day	21.16	14.28
SD	12.52	9.65

P < 0.0001

The highest percent of smokers among all age categories was the one that reported smoking fewer than 20 cigarettes a day, as depicted in table 4.27.

Table 4.27: Distribution of Cigarettes Smoked Per Day by Age

Number of cigarettes per day	Age groups					
	Youth	18-24	25-35	36-46	47-69	70 +
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
<20	79 (73.1)	450 (63.6)	683 (60.2)	681 (51.0)	908 (52.0)	71 (64.0)
20-40	27 (25.0)	250 (35.3)	432 (38.1)	614 (46.0)	782 (44.8)	40 (36.0)
>40	2 (1.9)	8 (1.1)	20 (1.8)	41 (3.1)	55 (3.2)	0 (0)
Total	108 (100)	708 (100)	1135 (100)	1336 (100)	1745 (100)	111 (100)

Table 4.28 demonstrates that the majority of urban (58.3%) and rural (49.9%) smokers smoked less than 20 cigarettes per day. Compared to urban smokers (41.6%), rural smokers (50 %) were more likely to report smoking more than one pack of cigarettes a day.

Table 4.28: Cigarettes Smoked Per Day Distributed According to Residential Setting

Number of Cigarettes per day	Residential setting				Total	
	Urban		Rural			
	No.	%	No.	%	No.	%
<20	2161	58.3	728	49.9	2889	56.0
20-40	1465	39.5	683	46.8	2148	41.6
>40	79	2.1	47	3.2	126	2.4
Total	3705	100.0	1458	100.0	5163	100.0

P<0.0001

Almost all the callers (97.3%) reported cigarettes as their only form of tobacco used. However, a small number of them mentioned that in addition to cigarettes they used cigars and smokeless tobacco, respectively (table 4.29).

Table 4.29: Types of Tobacco Used by Smokers Calling the TQL

Types of tobacco used	No.	%
Cigarette smokers only	5,173	97.3
Use Cigars also	94	1.7
Use Smokeless tobacco also	84	1.5
Use Pipe also	14	0.2
Use other types also	6	0.1
Total	5,371	100.0

For those who reported their age and were still current smokers (i.e. did not document a quit date), smoking duration was estimated. The minimum smoking-duration for the study population (No. 2,243) was less than a year. The highest smoking-duration estimated among this group was 62 years. The average smoking-duration was 22.76 \pm SD 13.03 years. Among blacks the average smoking duration (21.35 years) was shorter than

that among white smokers (23.77 years) (table 4.30). The difference was small, yet statistically significant ($P < 0.0001$).

Table 4.30: Distribution of Mean Smoking Duration by Race

Smoking duration (years)	White	Black
Number of smokers	1323	736
Mean	23.77	21.35
SD	13.12	12.72

$P < 0.0001$

Residence was not an influencing factor on the mean smoking duration among white smokers (table 4.31). However, the mean smoking duration among rural blacks (23.67 years) was higher than that among urban blacks (20.69 years). The difference was small, yet significant.

Table 4.31: Duration of Smoking in Years Distributed by Race and Residential Setting among Current Smokers

Race	Residence	No.	Mean Smoking Duration (years)	SD
White	Urban	847	23.95	12.98
	Rural	476	23.46	13.37
Black	Urban	578	20.69	12.37
	Rural	158	23.76	13.68

White $P > 0.05$

Black $P < 0.05$

A total of 2,218 current smokers were included in the calculation of the variable smoking pack-years. The minimum and maximum estimated scores or values were 0 and 196, respectively. The mean smoking pack years for the included study population was $25.23 \pm$ SD 24.06. Table 4.32 demonstrates the distribution of mean smoking pack years

by race. Blacks' mean smoking pack-years (17.65) was significantly (T test $P < 0.0001$) less than that among whites (30.07).

Table 4.32: Distribution of Mean Smoking Pack-Years by Race

Smoking pack-years	White	Black
Number of smokers	1310	729
Mean	30.07	17.65
SD	26.33	17.32

$P < 0.0001$

There was a small non significant difference in the means of smoking pack years between urban (17.27) and rural (19.07) blacks, as observed in table 4.33 and figure 4.5.

Table 4.33: Mean Smoking Pack Years Distributed by Race and Residential Setting

Race	Residence	No.	Smoking Pack-Years	SD
White	Urban	838	29.57	24.66
	Rural	472	30.95	29.07
Black	Urban	573	17.27	17.79
	Rural	156	19.07	15.46

White $P > 0.05$

Black $P > 0.05$

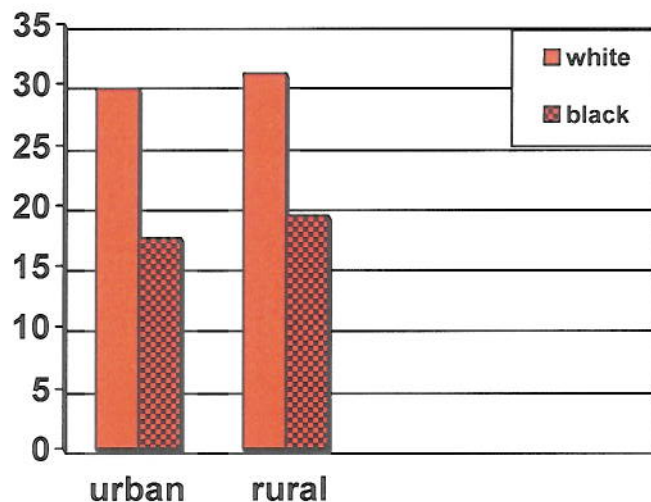


Figure 4.5: Mean Smoking Pack Years Distributed by Race and Residence

Smoking pack years value was divided into 4 categories represented in table 4.34. This table demonstrates that there are more blacks (43.6%) in the “10 and less smoking pack years” category than whites (26%). Accordingly, there were more whites (21.9%) in the “46 and more smoking pack-years” category than blacks (6.3%). Based on the Pearson Chi square significant ($P < 0.0001$) group differences were detected.

Table 4.34: Distribution of Smoking Pack Years According to Race

Smoking pack years	White		Black		Total	
	No.	%	No.	%	No.	%
10 & less	337	26.0	312	43.6	649	32.3
11-25	385	27.6	228	31.9	586	29.1
26-45	317	24.5	130	18.2	447	22.2
46& more	284	21.9	45	6.3	329	16.4
Total	1296	100.0	715	100.0	2011	100.0

$P < 0.0001$

Table 4.35 depicts the distribution of smoking pack years categories among black smokers according to residence. More urban blacks (45.9%) were in the “10 and less smoking pack years” category than rural blacks (35.3%). No difference was detected within the groups of urban and rural blacks. In addition, there were no significant differences ($P > 0.05$) between rural and urban white smokers with respect to their pack years.

Table 4.35: Distribution of Smoking Pack Years of Smokers by Residential Setting

Smoking Pack Years	Urban		Rural		Total	
	No.	%	No.	%	No.	%
BLACK SMOKERS						
10 & less	258	45.9	54	35.3	312	43.6
11-25	175	31.1	53	34.6	228	31.9
26-45	93	16.5	37	24.2	130	18.2
46 & more	36	6.4	9	5.9	45	6.3
Total	562	100.0	153	100.0	715	100.0
WHITE SMOKERS						
10 & less	216	26.1	121	25.9	337	26.0
11-25	225	27.2	133	28.4	358	27.6
26-45	211	25.5	106	22.6	317	24.5
46 & more	176	21.3	108	23.1	284	21.9
Total	828	100.0	468	100.0	1296	100.0

Black P> 0.05

White P> 0.05

CHAPTER V DISCUSSION & CONCLUSION

Tobacco Quit Lines (TQL) are an effective, government-funded, and convenient “telephone-based program” designed to assist tobacco users quit (Cummins, et al., 2007, p: i9). It provides information, counseling and support for different population groups. In addition, TQL plays an important role in promoting the use of pharmacotherapy (Bentz, et al., 2006; Carlini, et al., 2008, Schmitt, et al., 2007; Anderson & Zhu, 2007; Stead, et al., 2006).

Uncovering racial and regional differences in the smoking and quitting habits is important to assist minority groups in their efforts to reduce tobacco consumption and quit smoking (Cokkinides, et. al., 2008). The current study made use of the available Georgia TQL data set. The Centers for Disease Control and Prevention (CDC) has recommended that states regularly evaluate their TQL services for the following purposes: generating knowledge to improve the service; providing the health department with a quality assurance mechanism to assess vendors; and evaluating the volume and impact of utilization (CDC, 2004). The availability of this data set presented an opportunity to examine the characteristics of the callers to TQL among smokers in Georgia. The data set included information on callers from October, 2005 through April, 2007. The study sought to evaluate the utilization of the Georgia TQL by tobacco users and examine any differences in terms of racial makeup and place of residence. The study was designed to answer the following research questions.

With respect to the utilization of the Georgia TQL:

1. Are there racial or geographic differences among smokers in the rate of utilization?
2. Are there differences in the rate of calls per 1000 smokers across the 18 Georgia public health districts?
3. How did callers hear about the Georgia TQL?
4. Are there racial or geographic differences in the smoking pack years among callers?

Are there racial or geographic differences among smokers in the rate of utilization of the Georgia TQL?

The study showed that callers differed with respect to race, age, gender and educational attainment.

The current study showed that black, older adults, and female smokers were more likely to call the Georgia TQL. Approximately 60% of the callers were white. This percentage is logical because 61.1% of the population in Georgia is white (Bryan and Thompson, 2007).

With respect to age and race the Georgia TQL callers were different from those who called the Montana TQL. Harwell, et al. (2007) documented that younger than 45, white women were more likely to call the Montana TQL.

However, the current study revealed that older smokers were more likely to call. One-third of callers belonged to an older adult age group (47-69 years). These results of were consistent with those found in the published literature. For example, Zhu, et al. (2000) detected that older smokers tend to use smoking cessation aids more often than younger smokers. Swartz et al. (2005) found that the callers to the Main TQL were mainly females aged 45-46 years.

The current study revealed that black smokers (6.27 per 1000) utilized the Georgia TQL more than white smokers. The rate per 1000 black smokers was almost twice that per 1000 white smokers. This result was encouraging since racial and ethnic minority groups are known to less likely use smoking cessation aids (Cokkinides, et al., 2008). Those who mostly use smoking cessation aids are known to be white smokers (Hughes, et al., 1997).

Results showed that black and white smokers had almost similar educational attainment. The present study results were different from previous research (Swartz et al., 2005; Andoh, et al., 2008; Cokkinides, et al., 2008). This study revealed that the two racial groups mainly differed with respect to college degree attainment. White smokers who called the Georgia TQL were 1.19 times more likely to have a college degree. On the other hand, the majority of the black callers had a General Educational Development (GED) or a high school degree or more.

Black smokers' higher rate of utilization of the Georgia TQL can be explained on the following basis: 1) The black callers were older adults, with a mean age of 40.71 years; 2) Georgia TQL provides free services; 3) The callers represented an educated sample of the black smokers. The majority of them had at minimum a high school degree or its equivalent; 4) Black smokers are known to have higher interest in quitting (U.S. DHHS, 2000 b) and 5) Black smokers usually smoke menthol cigarettes (Pletcher, et al., 2006) and may find it harder to quit. Yet, Fu, et al. (2008) documented that smoking menthol cigarettes may not negatively affect smoking cessation rates among older smokers.

There are approximately 1.3 million smokers in the state of Georgia, representing 19.9% of the total adult population. According to the Georgia 2006 Behavioral Risk Factor Surveillance System (BRFSS) report, smoking prevalence is higher among men (22.4%) than among women (17.6%). However, this study revealed that more women called the Georgia Tobacco Quit Line (TQL) seeking help to quit. From October, 2005 through April, 2007, more than half of the smoker callers were women. Five of every 1000 female smokers in the state of Georgia called the TQL compared to three of every

1000 male smokers. Consistent with previous studies in the U.S. (Swartz, et al., 2005; Gilbert, et al., 2005; Harwell, et al., 2007) and Scotland (Platt, et al., 1997) that explored the characteristics of TQL callers, this study revealed that women were more likely to call the TQL than men.

In general women are more likely than men to seek assistance when trying to quit smoking (Zhu, et al, 2000, Carlini, et al., 2008). Female smokers are known to be more liable to relapse and therefore tend to use more ways to quit smoking than men (Andoh, et al., 2008). Abdullah, et al. (2004) suggested that men less frequently seek help than women.

Thus, the higher rate of women calling the Georgia TQL might be explained on the basis of females' vulnerability to smoke and males' resistance to seek help. Further, health care providers tend to screen females for tobacco use and advise them to quit more than males (Cokkinides, et al., 2008).

Teens are at a high risk to initiate and continue smoking (Ge, et al., 2006). The chances are low that people would start smoking after the age of 20 (Grimshaw & Stanton, 2006). Similar to Swartz et al. (2005), the Georgia study demonstrated that there were only a few calls from adolescent smokers (2.1%). Therefore, special attention is needed to help teens stop smoking as early as possible or prevent them from starting (Ge, et al., 2006).

Curry et al. (2007) wrote that young people are known to have a harder time quitting, staying abstinent and experience relapse more often than older adults. This may explain the low rates of young callers to the TQL among the young age group (Curry, et al., 2007). The current study showed that older smokers were more likely to call the

Georgia TQL in an attempt to stop smoking. Older smokers were shown to be more ready to quit than younger smokers, who were more ambivalent in deciding to quit (Gilbert, et al., 2005). Attractive age-appropriate communication methods should be created to reach smokers of different age groups. State-funded TQL needs to attract more adolescent smokers to help them quit. Internet-interventions or E-health present a unique opportunity to achieve this goal. TQL messages have a higher chance of reaching teens when posted online (Fiore, et al., 2008), particularly on popular websites like Myspace and Facebook. Gilbert, et al. (2005) reported that young people prefer using TQL more than face-to-face counseling and quit clinics and that cell phone use is very popular among them.

Demand for TQL can be increased by proper promotion campaigns (CDC, 2004). Raising tobacco prices, as well as promoting TQL, “can create synergy among different components of the anti tobacco programs” (CDC, 2004, P 5). Abdullah, et al. (2004) recommended that TQL promotional campaigns be tailored to increase their popularity among vulnerable population groups, such as racial minority groups and teenagers.

Are there differences in the rate of calls per 1000 smokers across the 18 Georgia public health districts?

The current study revealed that the rate of callers per 1000 smokers varies among different Georgia public health districts.

According to the 2006 Georgia BRFSS report, smoking prevalence varied across the 18 Public Health Districts (P.H.D). The proportion of adults who smoked cigarettes ranged from 14.5% in the DeKalb P.H.D. to 27.6% in the Rome P.H.D. The present study

shows that the rates of callers per 1000 smokers varied by P.H.D. The rates ranged from 2.4 in Clayton P.H.D to 16.5 in Gainesville P.H.D.

The majority of the Georgia P.H.Ds showed rates of callers per 1000 within a narrow range and close to the overall rate of 3.9. However, the rates of callers in Gainesville, Fulton, and DeKalb P.H.Ds were higher than the overall state rate. For example in Gainesville 22.1% of the population smoked cigarettes and the call rate was 16.5 per 1000 smokers. This rate might be due to chance or a true encouraging outcome of TQL promotion campaign in this P.H.D. Further investigation is needed to determine the reasons behind the differences in the rates of calls and to explore what would it take to increase the rates of calls. Results of this study demonstrated that the Georgia TQL mainly received calls from smokers residing in urban counties. Five of every seven (72%) callers to the Georgia TQL during the study period were from urban counties. In Fulton County which has the highest population density (717,126 people), only 15.5% of residents are smokers. This percentage is less than that of the overall smoking prevalence in the state of Georgia (Bryan & Thompson, 2007). The largest number of callers to the Georgia TQL was from Fulton public health care district.

This study supports earlier research that showed that fewer calls occur from rural areas (Swartz, et al., 2005). Northridge, et al. (2008) documented that residing in rural areas has a negative influence on quit rates, even after controlling for other factors such as gender, education, and smoking starting age. During the 18-month study period, the rate of utilization of the Georgia TQL by adult smokers was estimated to be 3.9 per 1000, which is 0.39%. Moreover, this study showed that the annual utilization rate of the Georgia TQL was 2.6 per 1000, which is 0.26%.

Considering the 1.3 million smokers in the state of Georgia, annual percentage of 0.26% translates into a large number of smokers that is difficult to ignore. However, this rate of use is lower than that (3.4%) of the Maine TQL in 2004 (Swartz, et al. 2005). The National TQL on average serves 1% of the U.S. smokers annually, and “this is not a negligible service effort” (Carlini, et al., 2008, p 75). Schroeder (2005) referred to the TQL as “the unsung hero” because it is one of the least utilized effective types of the smoking cessation aids (p 486). The low rates of use of the TQL can be explained on the basis that most smokers try to quit without help (cold turkey) (Hunt & Hepburn, 2006), or due to the lack of the Georgia TQL promotion campaigns. The low utilization of overall traditional cessation aids may be due to people are not ready to quit (Lee, et al., 2004).

How did callers hear about the Georgia TQL?

The current study revealed that there are differences in the main way callers heard about the TQL between the two racial groups in living in urban and rural areas.

Results showed a number of ways through which smokers have heard about the state TQL. The most commonly mentioned ways were, television (TV); health care professional; print media; and family and friends. Short, repeated messages on TV have been shown to be effective in promoting the use of tobacco cessation aids in general (CDC, 2000 b). In Scotland, Platt, et al. (1997) presented evidence on the effectiveness of mass media in promoting smokers to change behavior and stop smoking. Thus, TV advertisement has the power to increase the demand for TQL (Farrell, et al., 2007).

The current study showed that, regardless of race, TV was the dominant method through which smokers heard about the Georgia TQL. This finding is similar to findings

of a previous evaluation of the use of the Georgia TQL (Hunt & Hepburn, 2006).

Compared with white smokers, black smokers were more likely to report TV as the way they heard about the Georgia TQL. This can be explained on the basis that black and low-income people tend to watch TV for longer hours than others. (Lee, et al., 2004). Thus, TV presents an effective medium to penetrate the black smoking population which is least likely to use traditional cessation aids (Fiore, et al., 2008). Therefore creating TV messages tailored to black audience encouraging them to call the TQL, may be more cost-effective than trying to reach the entire smoking population with one message.

The current study also revealed that urban black smokers were more likely to report TV as the source of TQL information more often than rural black smokers. The latter group appeared to rely on health care professionals more than their urban counterparts.

The current study showed that less than a quarter of the smokers who called the Georgia TQL learned about it through their health care providers. The U.S. Department of Health and Human Services issued the Clinical Practice Guidelines: Treating Tobacco Use Dependence. This document included recommendations for the best practices in the treatment of tobacco use dependence (Fiore, et al., 2008). Health care providers are recommended to follow the clinical guidelines known as the five A's in order to help their smoker patients quit smoking (U.S.DHHS, 2000 b). Health care providers are advised to: 1) Ask about smoking status; 2) Advise smokers to quit; 3) Assess readiness to quit; 4) Assist smokers in quitting attempts; and 5) Arrange for follow up, usually two weeks after the set date to quit. In addition these guidelines recommended that health care providers attempt to motivate unwilling smoker patients to quit to consider quitting

(Fiore, et al., 2008; U.S.DHHS, 2000). Health care providers' advice to quit is significantly associated with the use of tobacco cessation aids by their patients (Cokkinides, et al., 2008). The low proportion of citing health care providers as the motivation to call the TQL may be due to one or more of these barriers: Lack of awareness among health care providers; time constraints; lack of familiarity with TQL; fear of negative beliefs; lack of financial incentives (Schroeder, 2005); lack of self-efficacy in their ability to coach their patients to quit smoking; lack of the required skills (Bentz, et al., 2006); and inability to change established practice (Blumenthal, 2007; CDC, 2004). In addition, some physicians may lack of knowledge about the state funded TQL and its services (Blumenthal, 2007). Thus, it is important to continue educating health care providers to adhere to the Clinical Practice Guidelines when treating tobacco use dependence (Fiore, et al., 2008; Andrews, et al., 2001; Freketich, et al., 2008).

There was a non-significant racial difference and a significant geographic difference in the rate of citing health care professionals as the way smokers heard about the Georgia TQL. Regardless of race, rural smokers were more likely than urban callers to report health care providers as the way through which they heard about the TQL. This finding was unexpected since rural areas are more likely to be medically underserved and face health care shortage (Blumenthal, 2007; Shugarman, et al., 2008). Rural people usually experience limited access to health care resources (Northridge, et al., 2008). Further research is needed in this area to identify better ways to communicate health messages to rural smokers, particularly to promote the use of smoking cessation aids.

The current study showed that there was no difference between the rates of black and white callers who were motivated to the TQL by health care providers. However, it

was documented that black smokers were less likely to be screened for tobacco use and to receive advice to quit by health care providers (Cokkinides, et al., 2008; Blumenthal, et al., 2007). Bentz, et al. (2006) recommended that more efforts are needed to encourage health care providers to connect black smoker patients with the TQL. The current study results suggest that health care providers are connecting more black smokers with the Georgia TQL. The rate of black smokers advised to quit by health care providers needs to be regularly monitored. Health care providers have the ability to close the health related racial gap by providing black smokers with the support needed to quit smoking.

Besides TV and health care professionals, there are other interventions that can reach smokers and encourage them to call the TQL. Other means reported by the current study population included the print media, word of mouth, the work place, the internet, phone directories and billboards. Carlini et al. (2008) revealed that telephone-based interventions have the ability to increase the demand for the TQL services.

Involvement in religion institution has a protective effect against smoking (Lee, et al., 2007). Therefore, churches may provide a good venue for promoting tobacco cessation methods among people, like spreading the word regarding the TQL availability and effectiveness.

Are there racial or geographic differences in the smoking pack years of callers to the Georgia TQL?

The current study revealed that there is a significant difference in smoking pack years between black and white smokers. However, within the same race there is no difference in smoking pack years across different geographical areas. The mean smoking

pack years for urban black smokers was similar to that for rural black smokers, and the same is true for white smokers.

The vast majority of the study population were still active smokers. Almost all (96%) of the active smokers called the Georgia TQL smoked every day. This percentage is higher than that estimated at the national level. Analysis of data from the 2006 National Health Interview Survey (NHIS) revealed that nationally there are 45.3 million active smokers and 80.1% of them smoke every day (CDC, 2007 c). The high percentage of the every day smokers revealed in this study may be due one or more of the following reasons: 1) Callers of the TQL do not represent the smokers in the general population. Those who call TQL or use smoking cessation aids in general tend to be heavier smokers (Zhu, et al., 2000); 2) smokers in the state of Georgia may be heavier smokers than smokers in other states.

This study showed that being white or a rural resident increased the likelihood of starting smoking at an earlier age. The mean starting ages among white and black callers were 16 and 17 years, respectively. This result was consistent with findings in the literature (Bryan & Thompson, 2006; Kanny & Figueroa, 2006). The chances are low that people would start smoking after age of 20 (Grimshaw & Stanton, 2006).

The study results demonstrated that, regardless of urban or rural setting white smokers smoked for longer durations than black smokers before they decided to call the TQL seeking help. Among black smokers, those living in rural areas smoked for longer duration before they called the TQL. The longer the duration of smoking makes quitting more difficult (Benowitz, 2008). The low percent of rural black callers to the Georgia

may be partly explained by the fact that they start smoking earlier in life. It may reflect a failure of the health care providers promotion campaigns to reach this population group.

Smoking Pack Years

Smoking pack years is a powerful indicator of dose when assessing the effects of smoking on health (Setty, et al., 2007; Polosa, et al., 2008; Gram, et al., 2008). Every pack-year unit is equivalent to consuming 20 cigarettes every day for a whole year (Setty, et al., 2007). The total number of pack-years is calculated by multiplying the number of cigarettes smoked per day divided by 20 by the duration of smoking in years (Setty, et al., 2007). The present study showed that the majority of callers had large number smoking pack years. This may be because heavier smokers seek help more than light smokers who in turn try to quit unassisted (Zhu, et al., 2000).

The results documented that white smokers' mean smoking pack-years was greater than that of black smokers. The mean smoking pack years among white and black smokers were 30 and 17, respectively. A mean smoking pack years of 30 reflects heavy smoking status among white smokers consistent with literature. Also, it was shown that compared to white smokers black smokers were more likely to be light smokers and free of chronic diseases. This result came paradoxical to that found in the published research. It is documented that black smokers carry a heavier burden of the smoking related health problems (U.S. DHHS, 2000). Black smokers, especially men have the highest rates of tobacco-related cancers, some of which are lung and bronchial; laryngeal; oral cavity and pharyngeal; esophageal; pancreatic; and kidney and renal pelvis cancers (CDC, 2008). This difference between black and white smoking pack years was expected. It was a logical consequence of a similar difference between black and white smokers with

respect to duration and the number of cigarettes smoked per day. Smoking pack years is a function of number of cigarettes smoked per day and total smoking duration. Within both racial groups, smoking pack years was not influenced by residential setting.

One way to help black smokers may be through making Nicotine Replacement Therapy (NRT) and other smoking cessation aids available at reasonable prices in the community health centers (U.S.DHHS, 2000) particularly those serving urban low-income population, such the South Side Medical Center in Atlanta Georgia.

Smokers in rural areas tended to smoke more heavily than their urban counterparts on number of pack years in urban and rural settings (Northridge, et al., 2008). Reasons that were suggested to explain this observation included: rural residents may rely more on the tobacco-growing economy; they may lack access to cessation aids including educational programs; and their lower levels of educational attainment (Northridge, et al., 2008).

Summary of findings

This study revealed that black smokers were 1.72 times more likely to call the Georgia TQL than white smokers. Their mean adult age was 40.71 years, which was similar to that of the white smokers. With respect to educational attainment, black smokers were less likely to have a college degree.

Black smokers had less chronic diseases than white smokers. They reported TV more often than white smokers as the main method they heard about the TQL. There was no difference between black and white smokers regarding health care providers' motivation to call the TQL. Compared to white smokers, black smokers started smoking

at an older age, consumed fewer cigarettes per day, and their mean smoking pack years was less.

Furthermore, urban black smokers sometimes differed from rural black smokers. For example, urban residents were more likely to hear about the TQL through TV, while rural black smokers mainly heard about it from health care providers. Rural smokers smoked for longer durations.

White smokers were less likely to call the Georgia TQL. They started smoking earlier in life, continued to smoke for longer durations and smoked more cigarettes on daily basis. Mean duration of smoking and pack years (30.07) did not vary across different geographic areas. They reported having more chronic diseases than black callers.

This study revealed that there were small differences in the educational levels between black and white callers. It is important to keep in mind the educational levels of smokers when designing health education campaigns to ensure their effectiveness in reaching the target audience. It is highly recommended that the younger and less educated smoking population be effectively reached and promoted to contact the TQL (Swartz, et al., 2005, Curry, et al., 2007).

Limitations and Caution

This study is not free of limitations. First, the TQL callers are not representative of the entire population of smokers in the state of Georgia. Second, the study analyzed data about calls rather than callers. Third, potential weaknesses arise from being a cross-sectional study. Fourth, data was collected for purposes other than conducting research or inferring relationships. Due to the nature of the data set, types of statistics that could be used were limited. Chi-square was frequently used to assess group differences. Due to the

large sample size, the majority of the differences detected in this study were statistically significant. Therefore, caution is needed when interpreting the results in general. It is important to keep in mind that chi-square has the ability to detect group differences rather than infer association.

It is important to note that some of the callers called more than once during the study period. The estimated annual rate falls within the expected range (0.01-4.28%) of TQL utilization, which was documented by Cummins, et al. (2007). The rate of utilization revealed by the current study may be an underestimation since many tobacco user callers were excluded from the calculation for missing data in other variables.

Smoking pack years may not present an accurate reflection of the tobacco consumed by the callers. The number of cigarettes smoked per day reported by callers may not represent the actual number smoked. Callers reported their current number of cigarettes used and that number was used to roughly estimate the average number of cigarettes over the years. It is known that smoking intensity and frequency varied over the duration that person smoked. Adults consume more tobacco than younger people and seniors, and they smoke on regular basis (Al-Dulaimy, et al., 2007).

Future research

Based on the findings from this study, further study and analysis in three specific areas would yield important insights into the Georgia TQL services. First is the need for a more in-depth study and analysis of the racial differences in utilizing smoking cessation aids in general, and the TQL in particular (Cokkinides, et al., 2008). Such a study would provide greater clarity on the effect of race on the decision to call.

Second, regular studies to evaluate the state-funded TQL utilization and effectiveness are highly recommended. Such evaluation studies can have the following benefits: monitor the rate of utilization and assure service quality; and continuously identify gaps in knowledge in this young field of research (Cummins, et al, 2007).

Finally, data gathered in this study did not allow for an analysis to explain the difference in the rate of 16 calls per 1000 smokers documented in Gainesville (compared with 3.9 calls per 1000 Georgia-wide). A case study designed to examine the factors associated with this wide disparity could yield valuable information.

In addition, this study showed that black smokers have less chronic diseases than white smokers. The basis for this finding cannot be fully anticipated and merit further studies.

As discussed in the methodology section, the Georgia TQL registry yielded many incomplete and missing data. Thus, it needs to be improved. Incomplete and inconsistent information need to be minimized, so that the data can be analyzed frequently to evaluate the rate of use of the TQL. The Georgia TQL is one of the cost-effective methods in the treatment of tobacco dependence (Hunt and Hepburn, 2006), serving 1.3 million smokers in Georgia (Bryan & Thompson, 2007). Thus, their data collection and follow up abilities need to be at the same level.

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Appendix A

The Distribution of Calls to the Georgia TQL according to Counties of Residence

County	Number of calls	Percentage
Appling	9	0.2
Atkinson	3	0.1
Bacon	16	0.3
Baker	4	0.1
Baldwin	22	0.4
Banks	9	0.2
Barrow	34	0.6
Bartow	49	0.9
Ben Hill	22	0.4
Berrien	17	0.3
Bibb	91	1.6
Bleckley	7	0.1
Brantely	17	0.3
Brooks	7	0.1
Bryan	29	0.5
Bulloch	30	0.6
Burke	10	0.2
Butts	20	0.4
Camden	37	0.7
Candler	7	0.1
Carroll	79	1.5
Catoosa	24	0.4
Charlton	6	0.1
Chatham	140	2.6
Chattooga	15	0.3
Cherokee	74	1.3
Clarke	42	0.8
Claton	1	0.0
Clay	2	0.0
Clayton	123	2.3
Clinch	1	0.0
Cobb	313	5.8
Coffee	21	0.4
Colquitt	36	0.7
Columbia	26	0.5
Cook	9	0.2

Coweta	52	1.0
Crawford	6	0.1
Crisp	17	0.3
Dade	9	0.2
Dawson	17	0.3
Decatur	11	0.2
DeKalb	418	7.7
Dodge	11	0.2
Dooly	7	0.1
Douglas	66	1.2
Early	6	0.1
Effingham	25	0.5
Elbert	14	0.3
Emanuel	9	0.2
Evans	7	0.1
Fannin	12	0.2
Fayette	30	0.6
Floyd	78	1.5
Forsyth	33	0.3
Franklin	21	0.4
Fulton	610	11.4
Gilmer	21	0.4
Glascocock	3	0.1
Glynn	37	0.7
Gordon	30	0.6
Grady	9	0.2
Greene	10	0.2
Gwinnett	251	4.7
Habersham	38	0.7
Hall	88	1.6
Hancock	4	0.1
Haralson	28	0.5
Harris	17	0.3
Hart	15	0.3
Heard	10	0.2
Henry	100	1.9
Houston	56	1.0
Irwin	7	0.1
Jackson	33	0.6
Jasper	4	0.1
Jeff Davis	14	0.3
Jefferson	15	0.3
Jenkins	7	0.1
Johnson	4	0.1
Jones	7	0.1

Lamar	13	0.2
Lanier	5	0.1
Laurens	39	0.7
Lee	21	0.4
Liberty	42	0.8
Lincoln	6	0.1
Long	4	0.1
Lowndes	72	1.3
Lumpkin	13	0.2
Macon	13	0.2
Madison	22	0.4
Marion	6	0.1
McDuffie	12	0.2
Mcintosh	6	0.1
Meriwether	32	0.6
Miller	4	0.1
Mitchell	14	0.3
Monroe	9	0.2
Montgomery	8	0.1
Morgan	9	0.2
Murray	37	0.7
Muscogee	146	2.6
Newton	38	0.7
Oconee	13	0.2
Oglethorpe	6	0.1
Paulding	56	1.0
Peach	25	0.4
Pickens	15	0.3
Pierce	23	0.4
Pike	15	0.3
Polk	38	0.7
Pulaski	3	0.1
Putman	10	0.2
Quitman	2	0.0
Rabun	18	0.3
Randolph	2	0.0
Richmond	181	3.4
Rockdale	51	0.9
Schley	5	0.1
Screven	11	0.2
Seminole	1	0.0
Spalding	53	1.0
Stephens	32	0.6
Stewart	4	0.1
Sumter	17	0.3

Talbot	7	0.1
Taliaferro	1	0.0
Tattnall	19	0.4
Taylor	3	0.1
Telfair	8	0.1
Terrell	6	0.1
Thomas	17	0.3
Tift	23	0.4
Toombs	16	0.3
Towns	4	0.1
Treutlen	2	0.0
Troup	42	0.8
Turner	11	0.2
Twiggs	11	0.2
Union	5	0.1
Upson	42	0.8
Walker	45	0.8
Walton	24	0.4
Ware	51	0.9
Warren	4	0.1
Washington	12	0.2
Wayne	21	0.4
Webster	1	0.0
Wheeler	4	0.1
White	19	0.4
Whitfield	86	1.6
Wilcox	11	0.2
Wilkes	4	0.1
Wilkinson	10	0.2
Worth	16	0.3
Total	5,371	100

Appendix B Georgia BRFSS 2006 Data Summary

Georgia DHR, Division of Public Health, Office of Health Informa...

<http://oasis.state.ga.us/oasis/brfss/qryBRFSS.aspx>

Prevalence of Binge Drinking among Adults Georgia Residents, Year 2006

SUBJECT AREA	% YES	CL YES	% NO	CL NO
Total	12.0	10.8-13.3	88.0	86.7-89.2
Sex				
Male	16.3	14.3-18.5	83.7	81.5-85.7
Female	7.9	6.8-9.2	92.1	90.8-93.2
Race / Ethnicity				
White	13.2	11.9-14.7	86.8	85.3-88.1
Black	8.7	6.7-11.2	91.3	88.8-93.3
Other	11.1	6.8-17.6	88.9	82.4-93.2
Hispanic	NA	NA	NA	NA
Age				
18-24	21.7	16.4-28.1	78.3	71.9-83.6
25-34	15.7	13.0-18.8	84.3	81.2-87.0
35-44	13.6	11.6-16.0	86.4	84.0-88.4
45-54	9.9	8.2-11.8	90.1	88.2-91.8
55-64	6.2	4.7-8.3	93.8	91.7-95.3
65+	2.6	1.9-3.8	97.4	96.2-98.1
Income				
Less Than \$15,000	9.9	6.8-14.0	90.1	86.0-93.2
\$15,000 - \$24,999	9.7	7.2-13.0	90.3	87.0-92.8
\$25,000 - \$34,999	9.8	6.9-13.6	90.2	86.4-93.1
\$35,000 - \$44,999	11.9	9.0-15.6	88.1	84.4-91.0
\$50,000 - \$74,999	11.8	8.7-15.8	88.2	84.2-91.3
\$75,000 or More	16.3	14.0-18.9	83.7	81.1-86.0
Education				
Less Than High School	13.6	9.6-18.9	86.4	81.1-90.4
High School Grad	11.2	8.9-14.1	88.8	85.9-91.1
Some College	11.6	9.6-14.0	88.4	86.0-90.4
College Grad	12.5	10.9-14.3	87.5	85.7-89.1
Health Coverage				
Has Health Coverage	11.8	10.5-13.1	88.2	86.9-89.5
No Health Coverage	13.6	10.5-17.4	86.4	82.6-89.5

* = Number of respondents that answered questions in the corresponding category.
 ^ = Percent of adults who either have the chronic condition, participated in the risk behavior or preventive practice in the corresponding category.
 NA = Not available if the unweighted sample size for the denominator was < 50 or the CI half width was > 10 for any cell.

The additional information regarding the survey may be found at <http://www.health.state.ga.us/epi/brfss/index.asp>.

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