



**Institute of Community & Public Health**

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**Final Report**

**Smoking and Associated Factors in the  
Occupied Palestinian Territory**

**An analysis of three Demographic and Health Surveys  
(1995, 2000, and 2004)**

**April 2008**

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**ABBREVIATIONS**

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oPt	Occupied Palestinian Territory
DHS	Demographic and Health Survey
PCBS	Palestinian Central Bureau of Statistics
ICPH	Institute of Community and Public Health
WHO	World Health Organization
GYTS	Global Youth Tobacco Survey
UNRWA	United Nations Relief and Works Agency
MoH	Ministry of Health

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**EXECUTIVE SUMMARY**

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Smoking is one of the major preventable causes of disease, death, and disability in the world, yet data on prevalence and trends is limited especially in developing countries. In the Occupied Palestinian Territory the data available on smoking and factors associated with initiating and maintaining smoking are limited. This report presents an analysis of data collected from the Demographic Health Survey (DHS) by the Palestinian Central Bureau of Statistics (PCBS). Data was collected in 1995, 2000, and 2004 by conducting interviews with an eligible female in each household, information on selection of the female is provided elsewhere (PCBS 2006). The prevalence of smoking in the general population is presented along with the different factors associated with smoking behavior. Results from this report will be used for development of further studies aiming to provide empirical evidence for the development of health policies and community based interventions aiming to reduce the burden of smoking among youth especially those living in stressful environments.

Results from the 2004 survey indicate that 17.4% of the population aged 10 and above were smokers. There was no specific trend in smoking prevalence across the three years; where for individuals 14 years and above the prevalence was 21.1%, 23.6%, and 20.9% in 1996, 2000, and 2004, respectively. A similar trend was observed in adolescents, 4.9% of individuals between the ages of 12-18 years old reported smoking in 2000, which dropped to 2.7% in 2004. From the variables assessed in this study it appears that gender, education, whether parents are still alive, and area of residence are statistically significantly related to smoking status in the Occupied Palestinian Territory.

More in depth analysis of smoking trends was not feasible due to some limitations in the data present. Information in each questionnaire was collected from the female head of household; these results might not be reliable especially when information is collected for young individuals and especially when such information is collected on smoking behavior. Time comparisons were an objective of this study yet because the three surveys were modified, this was not possible. Further studies should be developed and conducted in order to start a database on smoking trends over the years so that interventions can be

implemented and their effects be assessed. Other variables should also be investigated in so that their relationship to initiating smoking can be assessed.

This preliminary analysis indicates that individuals living in more violent areas such as the north of the West Bank have a higher prevalence of smoking compared to those living in South and Central of the West Bank and thus variables measuring exposure to violence may be related to smoking behavior. Future studies should investigate in such non-classical factors that are specific to the Occupied Palestinian Territory including violence and violence related events.

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## **BACKGROUND**

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### ***Introduction***

Smoking is one of the leading causes of death in the world. The WHO estimates that smoking is also the leading cause of disease burden (measured in disability adjusted life years lost DALYs) in developed countries. “While the developed nations are becoming increasingly aware of the cost to health of smoking, an enormous market is emerging in third world countries” (Nath 1986). Data from developed countries demonstrates a decrease in smoking prevalence, yet prevalence is constantly increasing in developing countries, especially in women and children (Shibuya, Ciecierski et al. 2003). The fact that a considerable proportion of this increase is in youth is alarming yet the scientific and public health literature lacks information on this issue in developing countries and thus the prevalence of smoking in different age groups as well as the factors associated with smoking is not well researched. This report explores the Demographic Health Survey data collected by the PCBS in 1996, 2000, and 2004 in an attempt to get an estimate of the prevalence of smoking in the Occupied Palestinian Territory. Demographic characteristics and their effects on smoking behavior will also be investigated.

### ***Objectives***

To provide empirical evidence for the development of health policies and community based interventions aiming to reduce the burden of smoking among youth living in stressful environments. The empirical evidence includes:

- Prevalence of smoking in the general population in 1996, 2000, and 2006
- Exploring available factors associated with smoking behavior in the general population
- Exploring available factors associated with smoking behavior in adolescents (12-18 years old)

### *Literature Review*

In 2005 5.4 million deaths were attributed to tobacco use as projected by the WHO, this estimate is expected to rise to 6.4 in 2015 and to 8.3 million in 2030. Tobacco use is also responsible for 10% of all deaths globally (Mathers and Loncar 2006). Data from developed countries indicates a decline or at least stability in the prevalence of tobacco use. Analysis of data from the Behavioral Risk Factor Surveillance System (BRFSS) shows a stable prevalence of current smoking across the 50 US states between 1993, 1996, and 1999. Moreover, the proportion of heavy daily smokers decreased from 19% in 1996 to 17% in 1999 in the total population (Etter 2004).

A cross country comparison study was initiated by the Global Youth Tobacco Survey (GYTS) in 1999 as an attempt to develop a database for smoking prevalence and patterns; data was collected through a self-administered questionnaire from 43 countries for youth aged 13 to 15 years old. Information collected from students included prevalence of tobacco use, age of initiation, tobacco advertising, and school curriculum. Results presented indicate a median prevalence of ever smoking (minimum one puff) of 33%, and 23.9% of them started smoking before 10 years old. Current any tobacco users were defined as those who used any tobacco cigarettes in the past 30 days with a median prevalence of 18.7%. Current cigarette smokers were defined as those who smoked 1 or more cigarettes in the past 30 days, the median of current cigarette smokers was 13.9%. Prevalence in the Middle East appears to be higher than the median of all countries; in Jordan for example the proportion of ever smokers was 34.4% and 26.1% started smoking before the age of 10. Current cigarette smokers in Jordan were estimated at 16.6%. Looking at the Opt shows similar results. In Gaza Strip, the prevalence of ever smokers was 35.5%, of which 26.1% started smoking before 10 years old. In the West Bank the prevalence is even higher than that in Gaza strip, of the three regions in the West Bank, the North has the highest prevalence of 50.4% ever smokers, yet a lower percent of 24% starting to smoke before the age of 10 years old (GYTS 2002).

The Eastern Mediterranean Tobacco Control Profiles Survey (EMTCP) was initiated by the WHO Eastern Mediterranean Region in order to assess tobacco control activities in the region. Regional results of 20 countries that responded to this survey

indicate that 45% of countries lack programs for tobacco control, and that 70-85% have legislations that ban smoking in different public facilities, such as health, transportation and educational facilities. 83-89% identified lack of human and financial resources as the most important obstacle for tobacco control implementation programs (WHO 2003).

Other studies in the Middle East exploring smoking prevalence in adults give similar results of high prevalence. In Lebanon 825 individuals aged 19 years and above were randomly selected in 1997 and interviewed on their smoking behavior. The prevalence of smoking was 53.6%, with a higher percent for males than females (1:23 ratio). The highest prevalence was among the 30-39 years old group. Results illustrate a mean age of starting smoking of 19.7 years old and 90% of smokers started before 25 years old. The average duration of smoking was 20.4 years, while for ex-smokers it was 10 years. Of the different uses of tobacco, cigarettes were the most common (94.9%), other forms of consumptions included nargilla (14.6%), cigars (1.5%), pipe tobacco (1.3%) and cigarillos (0.5%). The average number of cigarettes smoked per day was 23.3, which varied by sex and employment status, but not by level of education. A quitting rate of 0.25 was observed, this rate did not differ by gender but statistically significantly increased with age, and was higher with more education levels, and lower for the unemployed (Baddoura and Wehbeh-Chidiac 2001).

A different study was conducted in Israel in an attempt to compare smoking behavior among different ethnic groups living there. The study looks at three health surveys conducted between 1999 and 2001 at the Israel center for disease control for individuals between the ages of 25 and 65. Smoking behavior was different among the different ethnic groups residing in Israel, with the highest prevalence for Arabs followed by Immigrants from the Former Soviet Union (fSU) and the prevalence was lowest for Jews. Smoking in females increased with age until 55 years old and then dropped again for fSU immigrants as well as for Jews but not for Arabs where prevalence was higher with age. Smoking was positively related with education levels only in Jews, while among fSU immigrants and Arabs this association was only observed in males (Baron-Epel, Haviv-Messika et al. 2004).

In attempts to reduce the prevalence of smoking efforts should concentrate on smoking in youth. In developed countries such as the US the average age of onset of

smoking is 12.3 years old and by the age of 18 years old about two thirds of youth have tried cigarettes(Krainuwat 2005). Studies on such proportions are limited in developing countries, but there is evidence of similar trends, GYTS study shows that 23.9% of ever smokers between the ages of 13 and 15 years old started smoking before the age of 10 years old(GYTS 2002). There evidence illustrates that smoking prevention as well as smoking initiation prevention in youth is successful in reducing the prevalence of smoking, because once initiation occurs, the odds of becoming a smoker increases by 4-6 times compared to those who never try smoking as adolescents (Krainuwat 2005). A number of studies have looked at factors influencing smoking uptake mainly in youth but are conducted almost entirely in developed countries. In New Mexico 982 adolescents were sampled from 12 high schools between 1998 and 1999. Of the study population 43% have ever smoked, of those 36% smoked at least one cigarette in the past 30 days. Results show that compared to never smokers, ever smokers were more likely to accept offers of cigarettes from friends and had more friends who smoked. In terms of current verses past users, current users were more likely to perceive that smoking was normative, had more smoking friends, and considered smoking more permissible at home than did past users (Buller, Borland et al. 2003). Specific to this region a study in Bahrain was conducted to assess the prevalence of smoking among secondary school boys. Of the 600 students sampled 25.8% were smokers, 23.3 were ex-smokers, and 50.8% were never smokers. Among individuals 13-15 years old the prevalence of smoking was 20.4%. The only factor differing among smokers and non smoker was family and/or friends disapproval of smoking behavior (Al-Haddad and Hamadeh 2003).

Influence and selection processes in friendships and their effect on smoking behavior has been well researched, providing evidence that supports the relationship between friends who smoke and increasing the likelihood of becoming a smoker. Since such results can be influenced by reverse causality where smokers would aggregate together, a longitudinal study was conducted in 10 Dutch middle schools, 1595 students between the ages of 10 and 14 were followed for a year and half. Results indicate a direct association between initiating smoking and having friends who smoke. If a student had a non smoker friend the probability of him/her being a smoker was 44% while this probability dropped to 18% if the friend was non-smoker. To assess causality a logistic

regression model was developed; results indicate that having a smoking friend increased the likelihood of smoking onset (OR: 1.74,  $p < 0.01$ ) (Engels, Vitaro et al. 2004). Results from this study as well as others indicate a positive relationship between youth smoking and having a parent who smokes, with an indication for a dose response effect if both parents smoke (Tyas and Pederson 1998), (Engels, Vitaro et al. 2004).

Studies in the Middle Eastern region show similar results of the effect of peers and adults on adolescents smoking behavior. A study conducted in Alexandria, Egypt randomly chose 8 schools and collected information for students between the ages of 13 and 18. Overall prevalence of ever-smoking, 30-day smoking, current smoking and susceptibility to smoking was 25%, 12%, 6%, and 38% respectively. Psychological smoking risk factors associated with ever smoking included sibling and parent smoking, followed by peer smoking. Perceived adult and peer smoking as well as positive beliefs about smoking were also associated with ever smoking but to a lesser extent. Stratifying by gender shows that these psychological factors have more effects on males compared to females (Islam and Johnson 2005).

Whether teachers smoke is another factor that plays a role in youth smoking, where in a number of studies teachers' smoking behavior appears to be related to student's initiation of smoking. A study conducted in Syria assessed the prevalence of smoking among school teachers. Results show that the prevalence of current smokers was 52.1% for males and 12.3% for females, while the prevalence of daily smoking was 44.3% for males and 5.7% for females. The data did not show any associations between prevalence of smoking and marital status, age of children taught, actual age of teachers, nor with length of tenure. Such daily exposure to teachers who smoke should be considered in assessing the factors associated with smoking among youth (Maziak, Mzayek et al. 2000).

Apart from finding the prevalence of smoking in the Occupied Palestinian Territory, this report will use the information presented above to compare smoking trends to other countries in the region as well as utilize the information on factors associated with smoking to see if such factors are also related to smoking in the Occupied Palestinian Territory.

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## METHODS

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### *Data collection*

The data analyzed for this report was obtained from three Demographic Health Surveys (DHS) collected by the Palestinian Central Bureau of Statistics (PCBS) in 1996, 2000, and 2004. Multilevel cluster sampling was conducted to determine the study population in all three surveys. Table 1 presents the sample size (in terms of households) for each year as well as the response rate. The surveys in each year included three sections, the first was a household questionnaire, exploring general demographic characteristics of the population, the second section was a mother's health questionnaire, and the final asked questions about the children in each household. The DHS focused on collected information regarding women's reproductive health, including, family planning, prenatal and postnatal health, and fertility preference and thus information was obtained for each individual living in the household by face to face interviews conducted with an eligible female who was used as a proxy for everyone in the household.

**Table 1:** Sample size and response rate of the DHS in 1996, 2000, and 2004. PCBS

<b>Year</b>	<b>Number of households sampled</b>	<b>Response rate</b>
1996	3,934	94.6%
2000	6,349	97.7%
2004	6,574	88.2%

### *Statistical analysis*

Variables used for this analysis included smoking status as well as other demographic variables such as age, gender, and employment status. The format of some questions was modified by the PCBS across the three surveys, for purposes of this study a number of variables were recoded so that comparison across the three years is possible. In 1996 the questionnaire asked whether each member smokes, while in 2000 and 2004 the question was more specific and asked about the different ways of consuming tobacco, including nargileh, pipe, and cigarettes. Since the proportion of smokers who use nargileh or pipe was very small individuals were regrouped into smokers and nonsmokers, and thus comparison with 1996 data was possible. "Ex-smokers" category was added to the

smoking question in 2004, to make comparisons possible, the question was recoded by adding up ex-smokers to non smokers, and thus all three surveys had two categories, “smokers” and “non-smokers”. Another difference in the questionnaire's format was the eligible age to ask individuals about their smoking status. In 1996 smoking status was requested for individuals aged 14 years and above, while the age dropped to 12 in 2000, and to 10 years old in 2004.

The demographic variables expected to be associated with smoking behavior were recoded to facilitate comparisons. Parents’ status was recoded into having either or both parents deceased or having both parents alive. Age was re-categorized from a continuous variable to a categorical variable with 10 year intervals; age was further categorized for subgroup analysis on adolescents. The refugee status variable was re-categorized from three categories into refugees (so that it would include registered and unregistered refugees) versus non refugees.

The analysis of the data included frequency tables for an overview of the general characteristics of the population for each survey, followed by stratifying the data according to smoking status (for each of the 3 surveys separately). Variables common to all 3 questionnaires were also compared and the chi-squared test was used to test the significance of differences between proportions. Finally, subgroup analysis was performed to further investigate different factors associated with smoking in adolescents as well as an in depth analysis of smoking in 2004. This report takes the following structure:

- Prevalence of smoking for individuals 14 years and above in 1996, 2000, and 2004.
- Prevalence of smoking for individuals 12 years and above in 2000 and 2004.
- Prevalence of smoking for individuals 10 years and above in 2004.
- Prevalence of smoking for individuals 12-18 years old in 2000 and 2004.

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**RESULTS**

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*Demographic characteristics*

Half of the population surveyed consisted of females and was distributed roughly equally among the 5 areas of the West Bank and Gaza, with half of individuals 15 years of age or older being married. One third of the population was less than 10 years old. The proportion of insured individuals increased across the year years, to reach 77% of the population in 2004. Education appears to have improved between 2000 and 2004; in general there are fewer individuals who never attended school and more individuals who are currently enrolled in school. Specific to education levels illiteracy rate decreased to reach 6.8% in 2004, while individuals who have a bachelors' degree or higher increased to 5.8% of the population. Table 2 below presents a summary of the general characteristics of the population surveyed.

**Table 2:** Demographic characteristics of subjects for 1996, 2000, and 2004. DHS-PCBS

<b>Variable</b>	<b>1996</b>	<b>2000</b>	<b>2004</b>
Sample size (N)	28,176	38,089	33,285
<u>Gender (%)</u>			
Female	49.4	49.5	49.4
Male	50.6	50.5	50.6
<u>Age group (%)</u>			
<10	33.1	32.8	29.9
10-19	24.8	23.8	25.5
20-29	16.4	16.4	16.3
30-39	9.9	11.3	11.2
40-49	6.3	6.4	7.5
50-59	4.2	3.9	4.5
60+	5.2	5.4	5.0
<u>Area (%)</u>			
North West Bank	24.8	24.2	27.5
Central West Bank	16.0	22.2	16.4
South West Bank	24.0	16.4	17.7
North Gaza	17.3	15.8	21.5
Central and South Gaza	18.0	21.4	16.9
<u>Marital status (%)</u>			
Never married	38.6	42.4	44.3
Married	56.0	52.9	51.4
Widowed	4.4	3.9	3.5
Divorced	0.7	0.8	0.6
Other	0.3	-	0.2
<u>Type of Insurance (%)</u>			
Not insured	41.0	38.0	23.0
Insured	58.9	62.0	77.0
<u>Education attained (%)</u>			
Currently attending school	NA	40.9	44.4
Attended and dropped out		25.8	23.4
Attended and graduated		22.0	23.8
Never attended		11.3	8.4
<u>Education level</u>			
Illiterate	NA	9.7	6.8
Can read and write		18.7	15.2
Elementary		25.4	25.5
Preparatory		25.1	27.3
Secondary		12.9	15.7
Intermediate diploma		3.9	4.1
Bachelors and above		4.3	5.8

***Prevalence of Smoking***

This section gives a presentation of the prevalence of smoking in the Opt in 1996, 2000 and 2004. Table 3 includes individuals aged 14 years and above, presenting the prevalence of smoking in 1996, 2000 and 2004. Table 4 on the other hand includes individuals aged 12 years and above and presents the prevalence of smoking only in 2000 and 2004.

Table 3 indicates a prevalence of smoking in 1996 of 21.1%, even though the prevalence increased to 23.6% in 2000 it decreased again to 20.9%. The number of smokers was slightly lower in the Gaza region compared to the West Bank in all three years. One third of smokers were within the 30-39 age range, while 26.5% were married. The vast majority of smokers were males; 39.5% are males while only 1.8% were females. 0.3% of pregnant females reported smoking. Parents' status and education levels also appear to be associated with smoking behavior, where individuals with at least one deceased parent are more likely to smoke than those with both parents alive, and individuals with more than preparatory education are more likely to smoke compared to those with preparatory education.

**Table 3:** Comparing percent of smokers in 1996, 2000, and 2004 for individuals aged 14 years and older. DHS-PCBS

	<b>1996</b>	<b>2000</b>	<b>2004</b>
<u>Total</u>	21.1	23.6	20.9
<u>Area</u>			
North West Bank	23.7	27.1	25.7
Central West Bank	22.7	25.2	22.9
South West Bank	21.4	23.1	19.9
North Gaza	18.2	20.5	17.7
South and Central Gaza	17.5	20.0	15.4
<i>p-value</i>	--	--	--
<u>Region</u>			
Total West Bank	22.6	25.4	23.3
Total Gaza	17.8	20.2	16.6
<i>p-value</i>	<0.001	<0.001	<0.001
<u>Age group</u>			
14-19	6.7	8.5	5.6
20-29	25.9	27.1	24.2
30-39	30.8	33.0	29.9
40-49	27.7	32.0	29.7
50-59	22.0	25.2	23.7
60+	18.2	19.0	16.6
<i>p-value</i>	--	--	--
<u>Gender</u>			
Male	39.5	43.9	39.1
Female	1.8	3.1	2.3
<i>p-value</i>	<0.001	<0.001	<0.001
<u>Pregnancy status</u>			
Currently pregnant	0.3	2.4	1.8
Currently not pregnant	1.9	3.8	2.9
<i>p-value</i>	0.001	0.051	0.123
<u>Insurance</u>			
Insured	20.5	22.2	19.8
Not insured	21.7	25.9	24.2
<i>p-value</i>	0.071	<0.001	<0.001
<u>Marital status</u>			
Never married	15.0	17.8	14.3
Married	26.5	28.6	26.5
Widowed	6.5	8.5	6.9
Divorced	14.8	15.0	13.2
Other	18.0	--	14.3
<i>p-value</i>	--	--	--
<u>Parents status</u>			
Either or both dead	NA	26.3	22.3
Both alive		22.7	20.3
<i>p-value</i>		<0.001	0.001
<u>Refugee status</u>			
Refugees	NA	23.2	20.4
None refugee		23.9	21.2
<i>p-value</i>		0.252	0.192
<u>Education</u>	NA		
Preparatory		22.7	20.3
More than preparatory		26.3	22.3
<i>p-value</i>		<0.001	0.001
p-values for chi-squared calculations			

Data on smoking in 2000 and 2004 was collected from individuals 12 years and older, and thus table 4 presents smoking prevalence for individuals of that age range. The prevalence of smoking in 2000 was 21.8% but slightly decreased to 19.0% in 2004. Factors associated with smoking are similar across the different years, yet table 4 provides extra information on smoking and education levels. There was no specific trend for education levels, yet it appears that individuals with an intermediate diploma or a higher degree have the highest prevalence smoking, in 2000 31.5% of individuals with a bachelors degree or higher reported smoking, which dropped to 24.6% in 2004. In terms of education attendance, individuals who are currently attending school have the lowest prevalence of smoking.

**Table 4:** Comparing prevalence of smokers in 2000 and 2004 for individuals aged 12 years and older. DHS-PCBS

	<b>2000</b>	<b>2004</b>
<u>Total</u>	21.8	19.0
<u>Area</u>		
West Bank	23.7	21.4
Gaza	18.4	15.0
<i>p-value</i>	<0.001	<0.001
<u>Gender</u>		
Male	40.5	35.5
Female	3.0	2.1
<i>p-value</i>	<0.001	<0.001
<u>Pregnancy status</u>		
Currently pregnant	2.4	10.5
Currently not pregnant	3.8	2.9
<i>p-value</i>	0.027	0.062
<u>Parents status</u>		
Either or both dead	27.8	22.3
Both alive	20.4	17.7
<i>p-value</i>	<0.001	<0.001
<u>Insurance</u>		
insured	20.4	18.0
Not insured	24.1	22.4
<i>p-value</i>	<0.001	<0.001
<u>Marital status</u>		
Never married	14.7	26.5
Married	28.6	6.9
Widowed	8.5	13.0
Divorced	15.0	14.3
<i>p-value</i>	--	--
<u>Age group</u>		
12-19	6.5	3.0
20-29	27.1	24.2
30-39	33.0	29.9
40-49	32.0	29.7
50-59	25.2	23.7
60+	19.0	16.6
<i>p-value</i>	--	--
<u>Education</u>		
Illiterate	13.4	9.4
Can read and write	22.9	19.7
Elementary	19.6	16.7
Preparatory	23.0	20.2
Secondary	24.5	21.1
Associated diploma	26.8	23.7
Bachelor and above	31.5	24.6
<i>p-value</i>	--	--
<u>Education attendance</u>		
Currently attending	5.0	3.5
Attended and dropped out	30.3	28.1
Attended and graduated	29.2	26.5
Never attended	12.1	8.7
<i>p-value</i>	--	--
p-values for chi-squared calculations		

Overall smoking prevalence for individuals aged 14 years and above was stable between the three surveys except for a 2.5% increase between the 1996 and the 2000 surveys. The 2004 survey prevalence decreased from the 2000 survey to reach a similar percentage to that of the 1996 survey. Trends are similar for individuals 12 years and older, where smoking prevalence decreased from 2000 to 2004. This decreasing trend was also apparent when comparing subgroups, where adolescent smoking and smoking among pregnant women decreased by more than half. There was a smaller decrease in other subgroups such as region, parents' status, refugee status, insurance and education.

### *Subgroup analysis*

#### **Smoking and its associated factors in 2004**

A detailed analysis of smoking trends in 2004 was possible due to the availability of data. Table 5 presents the prevalence of smoking among individuals' aged 10 years and older; the total prevalence of smokers was 17.4% and only 3% of individuals aged 10-19 years old were smokers. The prevalence of smokers peaked at age group 30-50 and decreased after that. Yet in terms of ex-smokers there was a direct and constant increase in the number of ex-smokers with age.

**Table 5:** Selected characteristics stratified by smokers, ex-smokers, and never smokers for individuals 10 years and older, 2004. DHS-PCBS

	<b>Smoker</b>	<b>Ex-smoker</b>	<b>Never smoker</b>	<b>Total</b>
<b>Total (%)</b>	17.4	2.6	80.0	23321
<b>Age group (%)</b>				
10-19	3.0	0.0	96.9	8496
20-29	24.2	1.4	74.5	5427
30-30	29.9	3.5	66.6	3721
40-49	29.7	5.5	64.8	2512
50-59	23.7	7.0	69.4	1495
60+	16.6	9.7	73.7	1670
<b>Total (N)</b>	4056	614	18651	23321

Half of the population smoked 11-20 cigarettes per day, and individuals 40-59 years of age smoke the most number of cigarettes, yet a smaller proportion (11%) of 10-19 year olds smoking 11-20 cigarettes per day. In terms of gender, females are more likely to smoke 10 or less cigarettes per day, while half of the males smoke 11-20

cigarettes per day. An important indicator in assessing smoking trends is the proportion of smokers who started smoking before the age of 10 years old; results show that in this population 1.8% of current smokers started at 10 years old or at a younger age (not presented in tables).

**Table 6:** Number of cigarettes consumed per day for each age category, 2004. DHS-PCBS

	10 or less (%)	11-20 (%)	21-40 (%)	More than 40 (%)	Total (N)
<u>Age group</u>					
10-19	34.3	54.7	11.0	0.0	245
20-29	26.6	54.3	17.1	2.0	1198
30-30	18.7	54.0	23.1	4.2	1027
40-49	16.4	44.6	31.6	7.4	700
50-59	20.1	41.5	31.4	7.0	328
60+	22.4	48.2	22.9	6.5	245
Total	22.2	50.9	22.7	4.2	3743
<u>Gender</u>					
Males	21.0	51.5	32.2	4.3	3592
Females	51.7	36.4	9.9	2.0	151

The prevalence of smoking is roughly equal in the three different locality types (urban, rural, camp) in males, averaging at about 32.5%, yet when looking at ex-smokers it appears that rural areas have a higher prevalence compared to urban areas and camps. The prevalence for females is much lower (2%) and stratifying by locality type reveals different trends; the prevalence of smoking among females almost doubled for those living in urban areas compared to those living in rural areas and in camps.

**Table 7:** Prevalence of smoking in each locality type stratified by gender for individuals aged 10 years and older, 2004. DHS-PCBS

Gender	Locality	Smokers	Ex smokers	Never smokers
<b>Males</b>	Urban	32.3	4.3	63.4
	Rural	33.7	5.4	60.6
	Camp	31.1	4.9	64.0
Total (N)		32.5 (3830)	4.8 (568)	62.7 (7393)
<b>Females</b>	Urban	2.5	0.5	97.0
	Rural	1.4	0.3	98.4
	Camp	1.0	0.3	98.6
Total (N)		2.0 (226)	0.4 (46)	97.6 (11258)

As previously indicated smoking prevalence was higher in the West Bank compared to Gaza Strip (Tables 3 and 34), when stratifying by gender data indicates that

the difference in prevalence between the two regions was much greater in females than in males. Table 8 below illustrates this difference.

**Table 8:** Prevalence of smoking in males and females stratified by region for individuals 10 years and older, 2004. DHS-PCBS

<b>Gender</b>	<b>Residence</b>	<b>Smokers</b>	<b>Ex smokers</b>	<b>Never smokers</b>
<b>Males</b>	West Bank	36.4	4.6	59.0
	Gaza Strip	26.0	5.1	68.9
	Total (N)	32.5 (3830)	4.8 (568)	62.7 (7393)
<b>Females</b>	West Bank	2.7	0.6	96.7
	Gaza Strip	0.7	0.1	99.2
	Total (N)	2.0 (226)	0.4 (46)	97.6 (11258)

### **Smoking among adolescents (ages 12- 18)**

The majority of this subpopulation's characteristics are similar to those of the total population, education levels are an exception since it is usually confounded by age and thus table 8 below presents educational attainment and well as current education levels for adolescents aged 12-18 years old. Similar to the rest of the population education levels improved between 2000 and 2004, the proportion of individuals at the secondary level increased while it decreased for those who attended school for sometime and dropped out.

**Table 9:** Education characteristics for adolescents, 2000 and 2004. DHS-PCBS

	2000	2004
<b><u>Education attained</u></b>		
Illiterate	1.3	1.1
Can read and write	12.5	7.5
Elementary	49.5	47.6
Preparatory	33.9	40.0
Secondary	2.9	3.9
Total (N)	6133	5823
<b><u>Current education</u></b>		
Currently attending school	80.1	87.5
Attended but dropped out	14.3	8.2
Attended and graduated	4.9	3.4
Never attended school	0.7	0.9
Total (N)	6134	5823

Table 10 presents the prevalence of smoking among adolescents (ages 12 to 18) in 2000 and in 2004. Overall it appears that the percentage of adolescent smokers decreased from 4.9% in 2000 to 2.7% in 2004. This decrease in prevalence occurred mainly in

subjects who achieved elementary and preparatory education. This trend is not observed in illiterate adolescents, where smoking prevalence greatly increased between 2000 and 2004. In 2000 the proportion of smokers was highest for those who attended school and graduated (18%). The proportion of smokers decreased in almost each education category in 2004, and was highest for those who attended school but dropped out (14.9%). Such trend of decreasing smoking prevalence is consistent with the improvement in the overall education levels for this subgroup, presented in table 8 above.

**Table 10:** Selected characteristics stratified by smoking status for subjects' aged 12 to 18. DHS-PCBS

	<b>% Smokers in 2000</b>	<b>% smokers in 2004</b>
<b><u>Education attained</u></b>		
Illiterate	5.2	8.1
Can read and write	3.8	2.3
Elementary	4.0	1.5
Preparatory	6.5	4.1
Secondary	7.9	3.6
Total (N)	4.9 (6133)	2.7 (5823)
<b><u>Current education</u></b>		
Currently attending school	2.2	1.3
Attended but dropped out	16.0	14.9
Attended and graduated	18.0	10.1
Never attended school	0.0	5.8
Total (N)	4.9 (6134)	2.7 (5823)
<b><u>Parents status</u></b>		
Both dead	20.0	0.0
Only one alive	6.9	6.9
Both alive	4.7	2.5
Total (N)	4.9 (6134)	2.7 (5823)

There is a clear association between parents' status and smoking levels in this age group. The prevalence of smoking is highest among individuals who only have one deceased parent; this finding was constant among the two surveys. Similar to the total population, the prevalence of smoking among individuals with both parents alive decreased by almost half in 2004. Interpretation of results for the prevalence of smoking among individuals with both parents deceased was not possible in this age group due to the small number of individuals in that category.

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## DISCUSSION

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### *Trends in smoking prevalence*

The analysis presented above illustrates a decrease in the smoking prevalence in the general population. From these results it appears that the prevalence is lower than it is in other countries in the region, a study investigating in smoking trends in the general population of Lebanon indicated a prevalence of 53.6% for smokers aged 19 years and above (Baddoura and Wehbeh-Chidiac 2001). In Israel the prevalence is smaller, where 38.6% of males reported smoking, and 22.1% of females reported smoking in a survey collected in 1999-2001 for individuals aged 25-64 years old. More recent data collected in 2006 in the Opt supports the results of these findings, where the prevalence of smoking was 18.3% for individuals 10 years and older (PCBS 2007), a finding slightly higher than results from this analysis in 2004.

Data from study shows that this decrease occurred in different proportions according to the region. In Gaza the prevalence of smokers decreased in 2004 and was even lower than it was in 1996. This is probably due to the political situation and the changes that occurred after the second Intifada; the incursion imposed on Gaza by Israel prevented the entrance of many products including tobacco and thus it is not as available as it is in the West Bank, another likely cause is the lower socioeconomic status in Gaza compared to the West Bank. The different trends in the West Bank across the three years deserves special attention; even though smoking prevalence decreased in 2004 back to the same levels they were in 1996 in South and Central West Bank, the prevalence in the North remained high. Socioeconomic status is more equally distributed across the West Bank and is not likely the reason, a proposed cause for this difference might be the increased level of violence experienced in the Northern area compared to the rest of the West Bank. The association between violence and smoking prevalence has not been documented in the region. In New York for example, the prevalence and frequency of smoking increased after the September 11<sup>th</sup> attack (Vlahov, Galea et al. 2002). These results were replicated in other populations exposed to violence and/or disasters.

As expected, males, non-pregnant females, and individuals aged 30-50 years old had higher smoking prevalence compared to females, pregnant females, and individuals

less than 30 years old and older than 50 years old. These findings were also observed in other studies conducted in the region mainly due to the social stigma associated with female smokers; a study in Lebanon shows that 1 female for every 23 males is a smoker with an average age of 40.1 years old for smokers (Baddoura and Wehbeh-Chidiac 2001). Studies on smoking prevalence during pregnancy are limited; a study looking at argelleh use in Lebanon found a decreased prevalence from 29.3% for women before pregnancy to 23% during pregnancy (Chaaya, Jabbour et al. 2004). Individuals were less likely to smoke if both of their parents are alive, yet individuals were more likely to smoke if only one parent was deceased while the proportion was lower if both parents were deceased, this was also observed in subgroup analysis conducted for adolescents. Studies looking at similar indicators supported these findings, where individuals coming from a single parent household were more likely to smoke than those with both parents (Tewolde, Ferguson et al. 2006), (Tyas and Pederson 1998). This can be explained by the lack of supervision, it can also be due to the increased responsibilities of adolescents especially if they had to drop out of school to find a job to sustain the rest of the family. Unlike results from other studies education level was inversely related to smoking status, with the highest prevalence of smokers in individuals with a Bachelors degree or higher (Tewolde, Ferguson et al. 2006), (Tyas and Pederson 1998). It is expected that individuals with higher education levels have a better socioeconomic status, which is the likely explanation in the literature of such patterns. The contradicting results from this analysis can be explained by the general economic situation in the area, where those who are more educated do not necessarily earn more, mainly due to the high underemployment levels.

Among the different employment categories, the prevalence of smoking was higher for the currently employed compared to the non-employed. This might be due to financial reasons since employed individuals are more likely to receive an income and therefore can afford to buy and consume cigarettes. This is also supported by results from place of residence comparisons; the prevalence of smoking in the West Bank is higher than the prevalence in Gaza strip, and the latter has a lower socioeconomic status than the former, thus reinforcing the fact that smoking status might be directly related to income levels and socioeconomic level in general.

The difference in smoking levels between males and females suggests how strong of a confounder it is in most if not all the variables examined. In terms of parents' status, the strong relationship between having deceased parents and smoking was a lot stronger in males compared to females, yet these results were not presented due to the small sample size of females who smoke, especially when further stratifying by age. Such finding can be attributed to the dynamics of families in the region; a daughter with one or two deceased parents is likely to stay home and help around with chores, while the son is more likely to become employed, making him more exposed to smoking and thus more likely to smoke. Gender is also likely to confound the relationship between education levels and smoking, yet due to data limitations such assessment was not possible.

#### ***Smoking prevalence in 2004***

Data in 2004 was further analyzed to get a closer look at current trends in smoking in the Occupied Palestinian Territory. Similar to findings in 1996 and 2000 the prevalence of smoking was highest for age groups 30-50 years old; exploring proportions of ex-smokers shows a constant increase with age. Analysis of the number of cigarettes smoked per day was also possible, indicating that the majority of smokers smoked 11-20 cigarettes per day, yet stratifying by gender shows that this is true only for males, since more than half of the female smokers smoked 10 cigarettes or less. These results are consistent with other studies indicating that females not only have a lower prevalence of smoking but also smoke less per day (Baddoura and Wehbeh-Chidiac 2001). Such pattern was also detected with age; younger individuals not only had a lower prevalence of smoking, but those who did smoke had fewer cigarettes per day compared to older adults, who also have a higher prevalence of smoking. Such observations are of great importance for policy making, where these young individuals and females are easier targets for cessation programs. 3830 males and 568 females reported smoking in 2004 and thus further analysis of gender trends was possible. Preliminary analysis indicated no association between locality type and smoking prevalence, yet stratifying by gender shows that females were much more likely to be smokers if they lived in an urban setting compared to a rural setting or a camp. This can be explained by the differences in urban and rural settings, females are more exposed in urban areas, since they are more likely to be employed and more likely to be education, compared to rural areas. Females in urban

areas might also have a higher socioeconomic status than those living in rural areas, and thus they would be more able to consume cigarettes. Another difference in smoking trends was illustrated in region of residence. The analysis indicated a higher prevalence of smoking in the West Bank compared to Gaza strip, stratification by gender shows that this difference is much higher in females than it is in males. These gender differences reflect cultural differences within the different regions and localities. Individuals in Gaza are more conservative, they are thus less likely to smoke in general, but the females there are probably less exposed to others who smoke and are thus less likely to become smokers.

### *Smoking among adolescents*

Subgroup analysis investigating in smoking among adolescents aged 12 to 18 was conducted for the years of 2000 and 2004. Smoking trends in this age group were similar to those of the general population; the prevalence decreased by more than half across these two years, and was highest among individuals with one deceased parent. In both years smoking prevalence was high among those who are illiterate; it decreased with higher education levels, but then increased again in preparatory and secondary school. This can be explained by the friends' hypothesis where results from different studies indicate a direct association between initiating smoking and having friends who smoke (Engels, Vitaro et al. 2004), as adolescents get older they are exposed to others who smoke probably at school, but also outside of the school and thus are more likely to pick up the habit of smoking.

A decreasing trend between 2000 and 2004 was detected in adolescents; one likely explanation is the decreased socioeconomic status due to the political situation. Yet specific to adolescents this decrease is likely due to the improvement in education levels across these years. The number of drop outs from school greatly decreased between 2000 and 2004, and the number of adolescents who achieved elementary or preparatory school increased.

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## LIMITATIONS

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This report presents one of the first analyses attempting to estimate the prevalence of smoking in the general population and in specific subgroups in the OPT; however a number of limitations emerged from the data and are worth discussing. Smoking status, the main variable in this analysis was not clearly defined when the population was surveyed which can result in information bias; a definition can include the minimum number of puffs or the number of cigarettes smoked in the past month. If the majority of individuals perceived smoking as smoking at least every day the proportion presented in the results might be an underestimate, while if they perceived being a smoker as ever smoking at least one puff this proportion might be overestimated.

One individual in each household provided information for the rest of the household, if the interviewee happened to be a parent it is likely that the prevalence of smoking is underestimated, especially that of younger individuals since they probably hide such behaviors from adults. The same goes for the prevalence of smoking among females which might be underestimated due to cultural considerations.

Although one of the main objectives of this analysis was to assess trends of smoking prevalence across three years, it was not possible to make comparisons across the three years because questions were not standardized in the three surveys. This analysis was limited in age comparisons especially among adolescents, since smoking status was obtained for individuals 14 and above, 12 and above, and 10 and above in 1996, 2000, and 2004, respectively. Other variables such as insurance status were reformatted across the years and thus it was hard to assess the changes in their effect on smoking. The data indicates a slight change in the prevalence of smoking between 1996 and 2000, yet the drop is much greater between 2000 and 2004, this might also be due to changes in the question asked in the surveys conducted across the three years, the question in 2004 adds an extra category to the question: “ex-smoker”, if ex-smokers were identified as non-smokers in 2000 then it is likely that the big difference in the prevalence between 2000 and 2004 is not real and that it resulted only due to re-categorization of the choices available.

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**RECOMMENDATIONS**

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This report presented preliminary analysis on smoking trends in the Occupied Palestinian Territory. Target groups can be identified from these results so that smoking prevention and cessation interventions can be implemented. It is clear that interventions should target males in the general population, when looking at subpopulations females should be targeted in urban settings. In terms of youth focus should be drawn to individuals who are illiterate and those who can only read and write. Specific interventions should also target those who dropped out of school before graduating. It is clear that smoking prevalence is related to education levels, a result demonstrated by looking at changes in smoking prevalence and in education levels between 2000 and 2004. Focusing on further improving education levels is also expected to decrease the prevalence of smoking in all subgroups of the population.

Unmeasured confounders are always considered a limitation to any empirical study, variables related to income levels and socioeconomic factors can play a big role in determining smoking behavior and should be measured and analyzed. Other non classical factors should also be investigated in so that their effect on smoking can be determined. In the Palestinian Territory conflict and/or violence might be a strong factor involved with smoking behavior. Studies looking at stress and stressful events found a direct relationship with smoking behavior; it is likely that living in a conflict area such as the Palestinian Territory would increase the probability of taking up the habit of smoking. Further studies should attempt to look into such factors and how they change smoking behavior in different subgroups of the population.

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