All-cause and smoking-related mortality differences among different non-western ethnicities in the Netherlands

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Abstract

This research will clarify the picture of the health situation of non-western ethnicities in the Netherlands and the role of smoking. It also provides helpful background knowledge for policy makers of anti-smoking policies. The objective of this study is to give a picture of the all-cause mortality differences of Turks, Moroccans, Surinamers, Antilleans/Arubans and native Dutch in the Netherlands and to ascertain to what extent the smoking-related mortality affects mortality differences between these groups. Previous research has shown mixed results in the smoking mortality, with Turks and native Dutch men having the highest smoking mortality and Moroccan women the lowest. This research uses macro data of Statistics Netherlands of the period 2007-2011 to compare age-standardised all-cause and lung cancer mortality rates of the different ethnicities per sex. The smoking-attributable mortality fractions are derived using an adapted indirect Peto-Lopez method. In comparison to all Dutch men, Moroccan and native Dutch men had lower all-cause mortality rates and Turkish and Surinamese men significantly higher all-cause mortality rates. In comparison to all Dutch women, Moroccan, Turkish and Surinamese women had significantly lower all-cause mortality rates. Native Dutch men and women had higher smoking-attributable mortality rates than all other ethnicities. Without the effect of smoking, Surinamese and Antillean/Aruban women had significantly higher ASCDRs than the total Dutch female population. Further research could examine the prevalence of smoking among all ethnic groups as well as other lifestyle behaviours. Without the role of smoking, non-western ethnicities have relatively higher but still acceptable mortality levels.

Table of Contents

1. Introduction

1.1. Background

The topic of this research is all-cause- and smoking-related mortality among different non-western ethnic groups and native Dutch in the Netherlands. Normally non-western immigrants face more health difficulties than their native counterparts. It has been found, for instance, that immigrant groups in the Netherlands have had higher mortality rates than the native Dutch (e.g. Garssen et al., 2003). This paper attempts to give a picture of mortality rate differences between Turkish, Moroccan, Surinamese, Antillean/Aruban and native Dutch ethnicities and to show how much these differences are attributable to smoking.

From this research inferences comparisons can be drawn to other non-western immigrant groups in closely related Western European countries, such as Belgium, Germany or Denmark. This research will also update figures and trends of previous studies regarding smoking-related deaths and mortality among different ethnic backgrounds. It gives a picture of the health situation of various non-western ethnic groups and it shows how much smoking has played a part in this story. Furthermore, it provides a context in which Dutch policy makers can make better decisions in their anti-smoking policies.

Garssen and van der Meulen (2007) carried out extensive research on mortality and ethnicities in the Netherlands from the period 2002-2006. They reported that trachea cancers are far more prevalent among Turkish men than among Dutch men, indicating that Turkish men smoke more. The total share of lung cancer deaths out of all cancer deaths for men constitute 38% among Turkish men, 29% among native Dutch men, 23% among Antilleans/Arubans and 21% among Surinamese men. For Moroccan men lung cancer mortality is even lower, but not reported. However, the total death rate of all cancers is also less among Moroccan men. Among native Dutch women about 15% of cancer deaths are a result of lung cancer compared to 4% and 5% among Turkish and Moroccan women.

Previous research has shown that in the period 1985-2001 Turkish men smoked more (49-69%), Surinamese men smoked about the same (40-51%) and Antillean/Aruban and Moroccan men smoked less (37% and 23-34%) when compared to native Dutch men in the Netherlands (39-48%). These figures were respectively 31-47% for native Dutch women, 21-34% for Turkish women, 28% for Antillean/Aruban women, 17-22% for Surinamese women and 1-3% for Moroccan women. Especially Moroccan women show very low smoking rates compared to the other groups (Leest et al., 2002).

Nierkens et al. (2006) also carried out a smoking prevalence study for the period 2000-2003 among 1771 Turkish, Moroccan and Surinamese citizens of Amsterdam in the age of 35 to 60 years old. The results were that smoking rates were 63% among Turkish men, 55% among Suriname men and 30% among Turkish men. For Turkish women the smoking rates were 32%, for Surinamese women 30% and for Moroccan women less than 1%.

1.2. Objective and research questions

The objective of this paper is stated as follows: to give a picture of the all-cause mortality differences of Turks, Moroccans, Surinamers, Antilleans/Arubans and native Dutch in the Netherlands and to ascertain to what extent smoking-related mortality affects mortality differences between these groups.

The research questions of this paper are the following:

- What are the all-cause mortality differences between Turks, Moroccans, Surinamers, Antilleans/ Arubans and native Dutch in the Netherlands?

- To what extent does smoking-related mortality affect the all-cause mortality differences between Turks, Moroccans, Surinamers, Antilleans/Arubans and native Dutch in the Netherlands?

1.4 Structure of the paper

After the introduction, this paper will continue with a theoretical framework (chapter 2) in which the main theoretical findings concerning mortality, smoking-related mortality and smoking among non-western immigrants are outlined. In chapter 3 the methodology is given by which the research has been performed. The results in chapter 4 give direct answers to the research questions outlined above with a large table, a few graphs and accompanying text. Chapter 5 will finally give a synthesis of the results, conclusions and recommendations for further research.

2. Theoretical Framework

2.1 Introduction

This paper will show the differences in all-cause mortality and smoking-related mortality in order to see how much the smoking-related mortality differences influences the all-cause mortality differences between the non-western ethnic groups and the total Dutch population. The relevance of this research lies in showing whether possible mortality differences between non-western migrants and the total Dutch population are aggravated or not when leaving out the effect of smoking. As will be shown later, Blue and Fenelon (2011) found that the lower mortality rates of Hispanics in relation to Non-Hispanic Whites in the United States was explained due to the effect of smoking, implying that Hispanics are not prone to lower mortality in other areas.

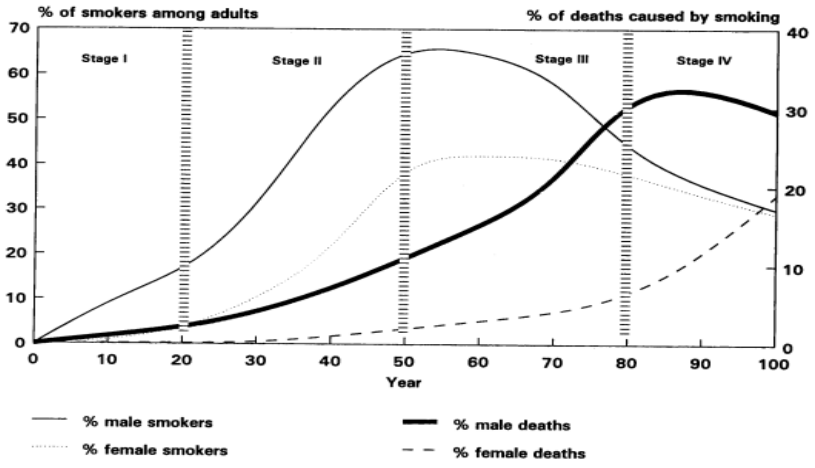
Another valuable aspect of this study is that it provides a vague but useful picture of historical smoking trends of the last decades of all researches ethnicities, since smoking affects mortality on the long term (Lopez. et al., 1994). In this way it is to some extent a continuation of previous research on smoking trends and ethnicity in the Netherlands, notwithstanding previous research on all-cause and smoking related mortality.

2.2 Theories

2.2.1 The cigarette epidemic theory

Drawing inferences between the prevalence of smoking and smoking-related mortality can be a tricky business. This is mainly caused by a long lag time between an individual's decision to start smoking and the development of a smoking-related disease. It can thus be the case that the actual prevalence of smoking is higher than is indicated by the smoking-related mortality rate or vice versa. The time lag is one of the defining characteristics of the cigarette epidemic theory developed by Lopez et al. (1994).

Figure 2.1. A model of the cigarette epidemic



Source: Lopez et al. (1994)

The cigarette epidemic has four stages, as can be seen in figure 2.1. The first stage is generally brief, comprising about one or two decades. In this stage male cigarette consumption is 15% or lower and female cigarette consumption usually does not exceed 10%. Naturally there is not a high prevalence of smoking-related diseases. In the second stage, which lasts for about two or three decades, the smoking prevalence of males rapidly rises to a point between 50% and 80%. The prevalence of smoking also rises among females, reaching about 40% at the end of this stage. In the third stage the prevalence of male and female smokers stagnates and then drops, whereas the number of smoking-related deaths still rise, due to the lag factor. The fourth stage is finally characterised by a stagnation and then a decline of smoking-related deaths among males to 30%, whereas the female smoking-related deaths are still rising to 20%. The prevalence of smoking still declines for both sexes, while it declines faster for males than for females.

This theory may show that the smoking epidemic is in different stages among different ethnic groups, especially since members of ethnic minorities may have a limited social network outside their ethnic group.

2.2.2 The possibility of a healthy migrant effect

In the United States there is a curious difference in the mortality between Hispanics and non-Hispanic whites in relation to their socio-economic status. This difference could be due to a healthy migrant effect, which states that people that migrate to other countries are generally healthier than people who stay behind, but also healthier than the host population, as they also consist of unhealthier individuals. Important assumed characteristics of migrants are that they are innovative, courageous, socially more skilled and that they have other lifestyles than the 'normal population', including characteristics such as smoking (Razum et al., 1998). Although Abraído-Lanza et al. (1998) could not find evidence for the healthy migrant hypothesis, Blue and Fenelon (2011) found that the healthy migrant effect did play a role when focusing on the role of smoking. The health disparities between whites, immigrants and Hispanics of the year 2000 were mainly due to the lower smoking-related mortality of the two latter groups, suggesting a healthy migrant effect. As the Netherlands also has a lot of immigrants, a healthy migrant effect could also account for mortality differences in this country, especially when smoking is taken into account.

2.3 Determinants of all-cause mortality

All data in this section, unless stated differently, comes from Statistics Netherlands (2013b). The largest determinant of Dutch all-cause mortality are cancers (32%) and cardiovascular diseases (29%). Respiratory diseases (non-cancers) account for 9.8% of all deaths, followed by psychic illnesses (5.6%), and injuries and poisonings (4.3%).

Out of these broad large-scale factors, coronary heart disease (7.6%) and lung cancer (7.5%) are the largest more specific causes of death of citizens of the Netherlands, followed by dementia (6.6%), stroke (6.6%) and heart failure (5.1%). The largest percentage of the total number of life-years lost (1,649,333 years in total) are due to lung cancer (9.5%), coronary heart disease (6.9%) and stroke (5.0%).

It has been estimated that for the period 2004-2008 26.6% of the male deaths were attributable to smoking compared to 11.0% among the women (Janssen and Spriensma, 2012).

2.4 Scientific findings on (smoking-attributable) mortality between different ethnicities

2.4.1 All-cause mortality differences between different (non-western) ethnicities

Bos et al. (2004) found that for the period 1995-2000, in comparison to the native Dutch, the relative risk of dying was significantly higher among the Turkish (1.21), Surinamese (1.24) and Antillean/Aruban (1.36) males and lower among Moroccan males (0.85). In comparison to the native Dutch females the chances of dying were not significant, except that they were somewhat higher among Surinamese females (1.10).

Mackenbach et al. (2005), did not only correct their results for the age, but also for marital status, region, rate of urbanisation and socio-economic status. They found that for the males, Turks had a higher relative risk of dying, and Moroccans a lower risk in comparison to the native Dutch. In comparison to native Dutch women, there were significant differences for other ethnic groups (Somalis had a higher risk of dying whereas Iraqi, Iranian and Vietnamese women had a lower risk of dying) but not for the ethnicities of this research.

Garssen and van der Meulen (2007) found that for the period 1996-2001, in comparison to the native Dutch men until the age of approximately 65, the Turkish, Surinamese and Antillean/Aruban men had higher mortality rates. Moroccan men had higher mortality rates until the approximate age of 40 years, after which their mortality chances dropped considerably in comparison to native Dutch men. For the highest age category (75+) all non-western ethnicities had lower chances of dying than native Dutch men. For the non-western women the chances of dying in comparison to the native Dutch were more fluctuating. In general Surinamese women had the highest mortality chances and Moroccan women the least. Below the age of approximately 40 the non-western ethnicities had higher mortality

chances for the women and after this age the mortality chances are generally lower, but also fluctuating.

In France in the period 1979-1991 the life expectancy of Moroccan men was 73.7 years compared to only 71.3 for native French men. Moroccan women, on the other hand, had a lower life expectancy (78.8) compared to native French women (79.6), although this difference is much smaller (Khlat and Courbage, 1996).

In the period 2004-2007 the relative risk of dying of almost all large non-western migrant groups in France was lower than the host population. Only Eastern European men, Algerian women and women of former French African colonies had higher relative risks of dying (Boulogne et al., 2012).

In England and Wales in the period 1991-1993 Caribbean males had lower standardised mortality rates than the total population, whereas African, Indian and Bangladeshi men had higher standardised mortality rates for the ages 20-64. African women of 20-64 years old also had higher standardised mortality rates than the total population, whereas no significant result were found for Caribbean and Indian women in comparison to the total population (Davey Smith et al., 2010).

2.4.2 Smoking-attributable mortality differences between different (non-western) ethnicities

Garssen and van der Meulen (2007) found that in the period 2002-2006, as stated in the background, the share of lung cancer mortality from the total cancer mortality was higher among Turkish men than among native Dutch men. Among Antillean/Aruban, Surinamese and Moroccan men the lung cancer mortality share was less. For women it was reported that the native Dutch women had a higher lung cancer mortality rate than all other groups with especially low lung cancer mortality rates for Turkish and Moroccan women.

In the period 1979-1991 Moroccan men had lower chances of dying of cancer of the trachea, bronchus and lung than native French in France. Moroccan women, surprisingly, had higher chances of dying of these cancers, although the latter result was only borderline significant (Khlat and Courbage, 1996). According to Bilgin et al. (as cited in Razum et al., 1998) Turkish men living in Germany smoke at least as much as native German men.

In the region of Madrid for the period 2000-2004 no significant differences in lung cancer mortality rates between various migrants groups were found. North African, Sub-Saharan African, Latin American and Asian immigrants groups all did not differ significantly from the host population (Regidor et al., 2008).

As mentioned previously, Hispanics were found to smoke less than non-Hispanic Whites in the United States (Blue and Fenelon, 2011).

2.4.3 Smoking behaviour between different (non-western) ethnicities

Kunst et al. (2008) report that there is much research conducted about current smoking behaviour among non-western ethnicities in the Netherlands, but that lifetime smoking exposure has not been a matter of much research. According to them, first generation immigrants were less exposed to smoking than the Dutch host population. This can be derived from the smaller smoking-attributable mortality rates among these groups. The present smoking rate is still lower among non-western ethnicities, especially among non-western women. Turkish and Surinamese men are an exception, because they show a higher current smoking prevalence, as was also reported by Nierkens et al. (2006).

Van Leest et al. (2002) also supports the finding for the period 1985-2001 that Turkish men smoke more than native Dutch men. They found that Turkish women smoke less. However, younger Turkish women smoke far more than older Turkish women. In addition, about 30% of Moroccan men smoke, whereas almost no Moroccan women smoke. Of Surinamese men and women combined, about 30% are smokers.

Reeske et. al (2009) compared smoking behaviour between native Germans and first and second generation Turks. In total, 421,635 Germans and 12,288 Turkish migrants were included in the research. Education was also added as a factor in this study. It was found that 47.0% of the first generation Turkish with a high education smoked, compared to 37.6% of the second generation. For the native Germans with a high education this number was 29.9%. For first generation Turkish immigrants with a low education 50.5% smoked, compared to 56.2% of the second generation Turks and 32.2% of native-born Germans.

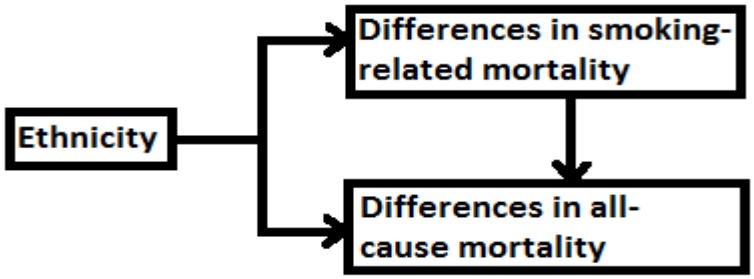
Hansen et al. (2008) compared the health status and health behaviour of non-Western immigrants to the host population in Demark with a study population of 14,566 persons. While differences were found in alcohol consumption (less consumption for immigrants), vegetable consumption (more consumption for immigrants) and leisure-time physical activity (less activity for immigrants), no significant results were obtained in relation to smoking behaviour.

2.5 Conceptual model and hypotheses

2.5.1 Conceptual model

Figure 2.2 depicts the conceptual model of this research. It has been shown from the theoretical framework that the ethnicity of a group of people can have an effect on the smoking-related mortality and on the all-cause mortality. It goes without saying that the smoking-related mortality of an ethnicity influences its all-cause mortality.

Figure 2.2. Conceptual model



2.5.2 Hypotheses

Since the native Dutch comprise about 80% of the total Dutch population, the hypotheses are made regarding the non-western ethnicities and the total Dutch population. The theoretical framework has been used to create the hypotheses. The hypotheses of this research are stated below.

- Turkish, Surinamese and Antillean/Aruban men have higher ASCDRs than the total Dutch population and Moroccan men a have lower ASCDR.
- Surinamese women have a higher ASCDR rate than the total Dutch population and there are no ASCDR differences between the other ethnic groups and the total Dutch female population.
- Turkish men have a higher smoking-attributable mortality fraction in comparison to the total Dutch population and the other ethnic groups have a lower smoking-related mortality rate.
- All non-western ethnic groups of women have lower smoking-attributable mortality fractions than the total Dutch population.

3. Methodology

3.1 Data

The objective of this study is to ascertain all-cause and smoking-related mortality differences between different ethnic groups and the total Dutch population. This is an observational, descriptive, quantitative analysis. The study population consists of all legal Dutch citizens in this retrospective, cross-sectional study.

This research uses secondary data from Statistics Netherlands from the period 2007-2011. All data is collected from vital statistics of the municipal population register (Gemeentelijke Basisadministratie). The all-cause- and lung cancer mortality rates per ethnicity and sex have been applied for at Statistics Netherlands. The population numbers per ethnicity and all variables regarding the total population of the Netherlands could be collected using the online Statline database of Statistics Netherlands.

All Dutch persons are defined as individuals who are counted in the population statistics as Dutchmen on a de jure base, meaning that if a registered Dutch person of Moroccan, Turkish, Surinamese or Antillean/Aruban background dies in his or her country of origin, he or she will be counted in the mortality statistics. This is due to the fact that all persons, internal and abroad, are included in the data when they are Dutch according to the Dutch legal system (Statistics Netherlands, 2013a).

3.2 Operationalisation

When comparing 'ethnicity' in the Netherlands there will be a focus on the country of origin of the individual and the parents. Migrant groups are defined as both first and second generation immigrants. The ethnicities that are included in this study are Turks, Moroccans, Surinamers, (former) Antilleans/ Arubans (in this research mentioned as Antilleans) and native Dutch. Native Dutch are defined as individuals who were born in the Netherlands and of whom their parents were also born in the Netherlands. When an individual is born in a foreign country and has two parents born in the Netherlands, he or she is also classified as Dutch. When an individual is born in the Netherlands and has two parents born from different countries, the country of origin of the mother is taken as his ethnicity. However, if only the mother is born in the Netherlands, the country of origin of the father will be taken as ethnicity of the individual. Finally, if an individual is born in a foreign country and his or her parents were not both born in the Netherlands, the country of birth of the individual is taken as his or her ethnicity (Statistics Netherlands, 2013a).

Lung cancer mortality is defined as deaths that are caused by ICD 10 codes C33-34 (Jemal et al., 2011).

Smoking-related mortality is defined as mortality that originates from smoking. The number of deaths of smoking-related diseases that would occur if nobody smoked is subtracted from the total number of deaths of smoking-related diseases, derived from the lung cancer mortality figures (Peto et al., 1992). The next subparagraph will deal more with this subject.

3.3 Study design

A total of five different ethnic groups will be compared to the total Dutch population for overall mortality and smoking-related mortality for the period 2007-2011. These five groups are divided by sex, making it a total sum of ten groups that are compared to the total Dutch population. There are three variables used as the researched input data of all groups: the average number of persons living in the period 2007-2011, the number of people that died during this period and the number of persons that died as a consequence of lung cancer during this period. All different groups are standardised for age in the following age categories: 0-34 years, then 5-year age categories until a last age category of 80+. The large age category 0-34 years is chosen because the smoking-related death rate under the age of 35 is negligible (Peto et al., 1992).

3.4 Methods

To acquire reliable all-cause and lung cancer mortality statistics of every ethnicity and gender, the data were standardised in accordance with the age distribution of the total Dutch population for the years

2007-2011. The average total population number was calculated by averaging the population of January 1st of each year with the next and then dividing the resulting five outcomes by five.

After the population numbers were calculated for all genders and ethnicities, overall mortality rates and lung cancer mortality rates were calculated using the direct standardisation technique (Preston et al., 2000). The mortality rates were standardised to the age distribution of the total population, resulting in an age standardised crude death rate (ASCDR) and an age standardised crude lung cancer death rate (ASCLCDR) per ethnicity and gender.

Subsequently, the ASCDRs and ASCLCDRs of all groups were compared to the total population per gender using the z-score, difference of proportions test. Since the data cover five years (from 2007 to 2011), the ASCDRs and ASCLCDRs are characterising the mortality rates of a five-year period. This means that the rates were not divided by five for the calculations of the differences of proportions test. The ASCDRs and ASCLCDRs are only shown for representativeness divided by five in the results section.

The next part of the research is to find out to what extent smoking-related mortality influences all-cause mortality between all ethnic groups in relation to the total Dutch population per sex. In order to do this, the smoking related mortality for the members of all ethnic groups aged 35 and above were calculated using lung cancer mortality statistics. This was done by using an adapted indirect Peto-Lopez technique (Peto et al., 1992) as was done by Janssen and Spriensma (2012).

With this technique, the lung cancer excess mortality rate per age category was first calculated, after which the etiologic fractions of smoking-related deaths could be calculated. To obtain the lung cancer excess mortality, the historical exposure rate to smoking was estimated by contrasting age- and sex specific lung cancer mortality rates of smokers and individuals who never smoked in the ACS CPS II study by five-year age groups (Peto et al., 1992). The etiologic fractions (EF) of smoking-attributable deaths (meaning the proportion of deaths attributable to smoking) per age category, sex and ethnicity were calculated by using the standard epidemiological formula of $EF = p(RR-1)/(p(RR-1)+1)$, where p stands for the proportion of the population exposed to smoking and RR stands for the relative risk of smoking per age and sex. The relative risks of smoking per age and sex were acquired by dividing the all-cause mortality rates among smokers and non-smokers of the CPS II study (Peto et al., 1992; Janssen and Spriensma, 2012). In addition, the excess risk of dying of smoking was reduced by 30% because of the possibility of residual confounding factors as a smoker may have a more unhealthy lifestyle in general (Ezzati and Lopez, 2003).

Just like in the previous analyses, the data for this research question has been standardised in accordance with the age distribution of the total population. Although a period of 5 years was covered, a yearly average of lung cancer deaths of the period 2007-2011 was taken to be used in the model, meaning that the total number of lung cancer deaths was divided by five. After the etiologic fractions of the smoking related mortality of each age category of each group was calculated, they could be multiplied by standardised share of deaths of each standardised age category of each group of the period 2007-2011. Then the smoking-attributable fractions were calculated and for each ethnicity compared to the smoking-attributable fractions of the total Dutch population per sex using the z-score difference of proportion test. For the difference of proportions test the total number of deaths per ethnicity was taken as the group value for the calculations.

The last part of the analysis deals more directly with how much smoking-related mortality has an effect on all-cause mortality. The smoking-attributable fraction of each ethnicity was multiplied by its ASCDR, resulting in ASCDRs without the smoking-attributable mortality. These, in turn, could also be compared using the z-score difference of proportions test. After this was done, comparisons of the normal ASCDRs with the non-smoking ASCDRs could be drawn.

4. Results

4.1 All-cause mortality differences between the different ethnic groups

The first two columns of Table 4.1 give an overview of the yearly ASCDR differences between all ethnic groups and the total population per sex of the period 2007-2011. Since both sexes were standardised with the total age distribution of the Netherlands, they can also be compared to each other for all statistics. Figure 4.1 gives a visual representation of the ASCDR differences among all males and females.

Among the males the Surinamers (10.37) and the Turks (9.90) have a significantly higher ASCDR than the total male population (9.70). No significant differences were found among the Native Dutch (9.69) and Antillean/Aruban males (9.44) in comparison to all Dutch males.

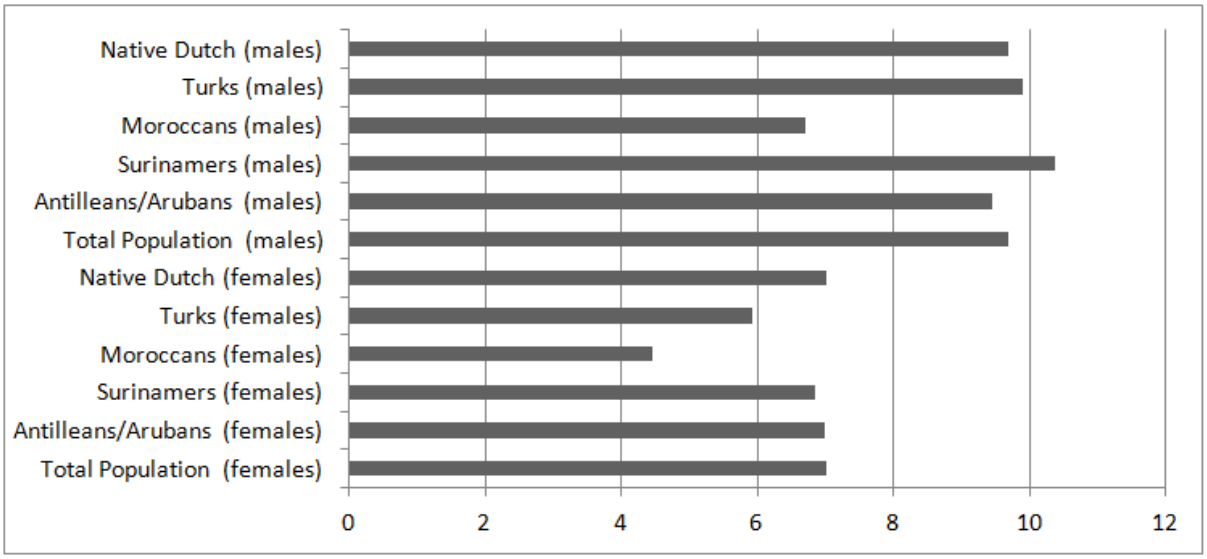
All groups of women have lower ASCDRs than the researched men except for Moroccan males, who have a lower ASCDR than native Dutch, Surinamese and Turkish women, as well as the total Dutch population of women. No significant differences were found between the native Dutch (7.01), Antilleans/Arubans (7.00) and Surinamers (6.86) in comparison to all Dutch females (7.00). Turks (5.92) and Moroccans (4.46) had significantly lower ASCDRs.

Table 4.1. Differences in all-cause mortality, lung cancer mortality, smoking-attributable mortality fractions and all-cause mortality without smoking between all ethnicities, the Netherlands, 2007-11.

	Differences between ethnicity and total population per sex							
	Yearly ASCDR	Sig.	Yearly ASC LCDR	Sig.	SAMF (%)	Sig.	Yearly non-smoking ASCDR	Sig.
Men								
Native Dutch	9.69	0.7648	0.92	0.0108	24.59	0.0012	7.31	0.0586
Turks	9.90	0.0325	0.68	0.0000	18.92	0.0000	8.03	0.0000
Moroccans	6.71	0.0000	0.58	0.0000	16.48	0.0000	5.60	0.0000
Surinamers	10.37	0.0000	0.52	0.0000	16.08	0.0000	8.72	0.0000
Antilleans/Arubans	9.44	0.1189	0.68	0.0000	19.93	0.0000	7.56	0.1242
Total Population	9.70		0.90		24.35		7.33	
Women								
Native Dutch	7.01	0.5680	0.42	0.0011	13.44	0.0042	6.07	0.5924
Turks	5.92	0.0000	0.12	0.0000	3.13	0.0000	5.74	0.0000
Moroccans	4.46	0.0000	0.09	0.0000	2.33	0.0000	4.36	0.0000
Surinamers	6.86	0.0891	0.19	0.0000	6.20	0.0000	6.43	0.0000
Antilleans/Arubans	7.00	0.9527	0.15	0.0000	5.00	0.0000	6.65	0.0000
Total Population	7.00		0.41		13.24		6.08	

Source Data: Statistics Netherlands. Own calculations

Figure 4.1. yearly ASCDR differences of all ethnicities, divided by sex, the Netherlands, 2007-11.

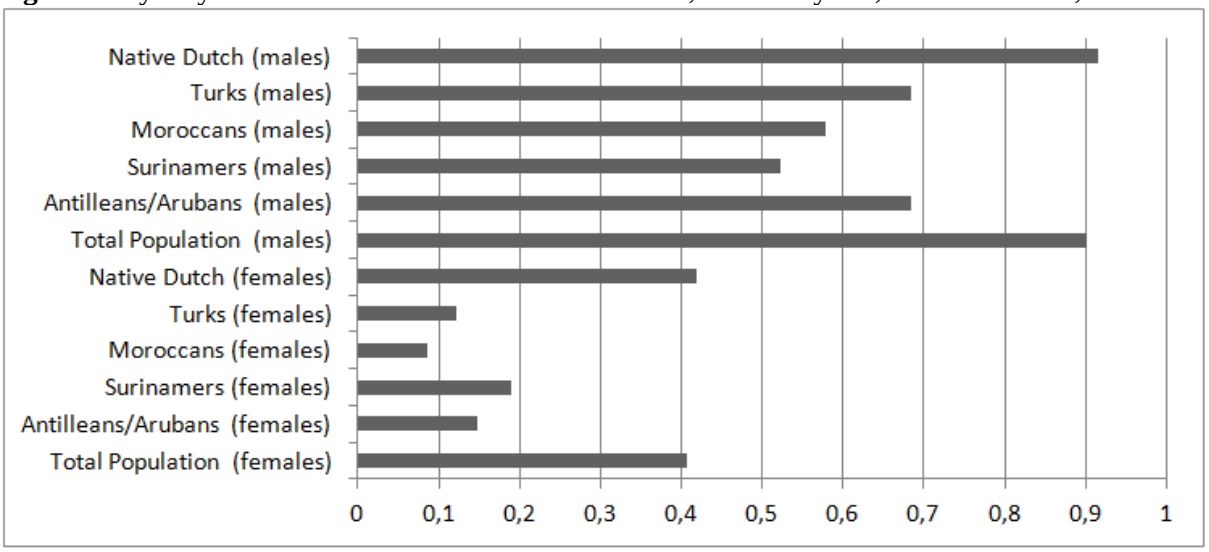


Source Data: Statistics Netherlands. Own calculations.

4.2 Lung cancer mortality differences between the different ethnic groups

The third and fourth columns of Table 4.1 give the yearly ASCLCDR differences of all ethnicities in comparison to the total Dutch population, divided by sex. Figure 4.2 gives a visual representation of all ASCLCDRs divided by sex.

Figure 4.2. yearly ASCLCDR differences of all ethnicities, divided by sex, the Netherlands, 2007-11.



Source Data: Statistics Netherlands. Own calculations.

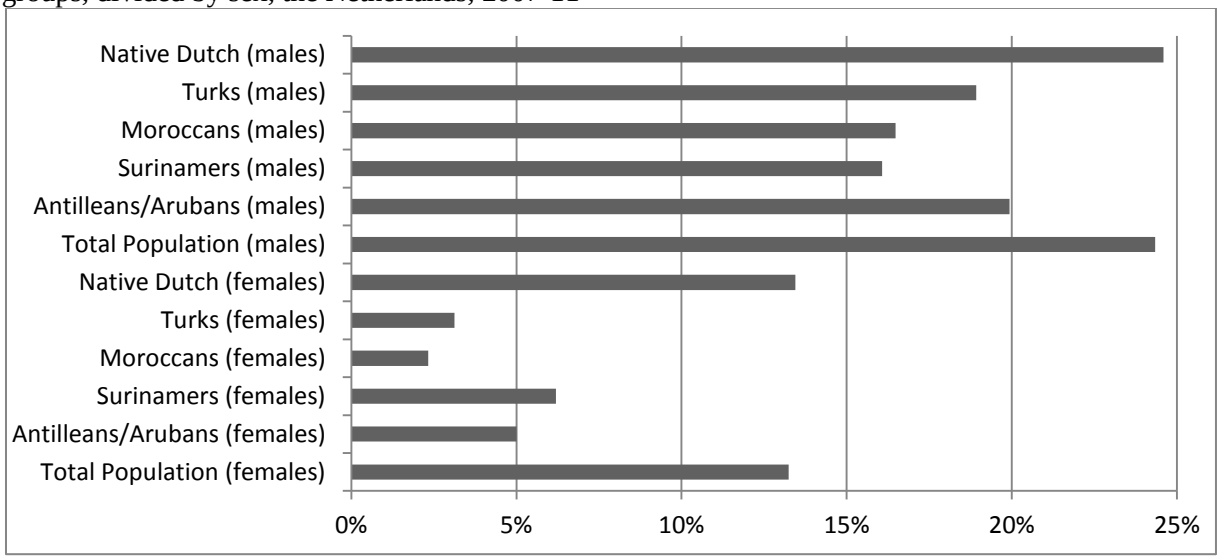
In comparison to the total Dutch population of males (0.90), the ASCLCDR of native Dutch males is significantly higher (0.92), whereas it is significantly lower for Antilleans/Arubans (0.68), Turks (0.68), Moroccans (0.58) and Surinamers (0.52). It is striking that for Surinamese males the ASCDR is highest whereas the ASCLCDR is lowest among the males.

In comparison to the total Dutch population of females the native Dutch women are also the only group that have a significantly higher ASCLCDR (0.41 compared to 0.42), all other ethnic groups have lower ASCLCDRs. From highest to lowest these groups are Surinamers (0.19), Antilleans/Arubans (0.15), Turks (0.12) and Moroccans (0.09). It is striking that all female groups have lower ASCLCDRs than all male groups. It is also striking that native Dutch females have a considerably higher ASCLCDR than the other ethnic groups of females.

4.3 Smoking-attributable mortality fraction differences between the different ethnic groups

The fifth and sixth columns of table 4.1 portray the smoking related mortality differences between the total Dutch population and all other ethnicities per sex. Figure 4.3 portrays the differences in smoking-related mortality among all groups visually.

Figure 4.3. Differences in smoking-attributable mortality fractions in percentages among all ethnic groups, divided by sex, the Netherlands, 2007-11



Source Data: Statistics Netherlands. Own calculations.

As is to be expected (when taking into account the ASCLCDRs) only the native Dutch population of males has a significantly higher smoking-attributable mortality fraction (24.59%) in comparison to the total population of Dutch males (24.35%). All other male ethnicities have significantly lower smoking-attributable mortality fractions. From highest to lowest these groups are Antilleans/Arubans (19.93%), Turks (18.92%), Moroccans (16.48%) and Surinamers 16.08%).

Among the native Dutch females (13.44%) the smoking-attributable mortality fraction is also only higher in comparison to the total Dutch female population (13.24%). Significantly lower smoking-attributable mortality fractions are among Surinamers (6.20%), Antilleans/Arubans (5.00%), Turks (3.13%) and Moroccans (2.33%).

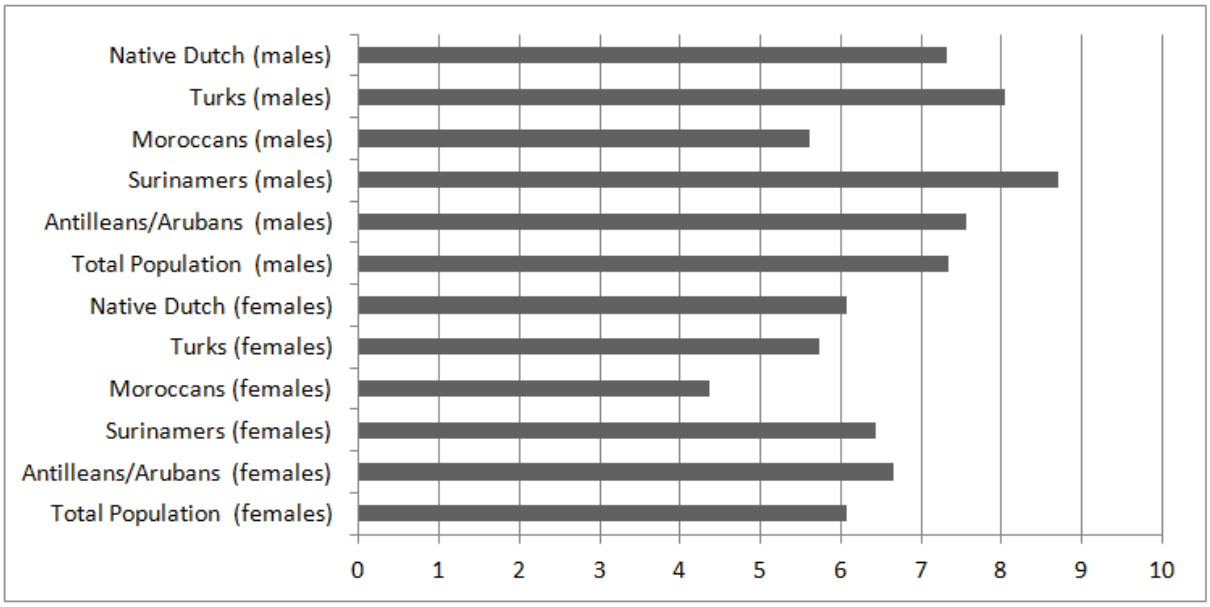
4.4 The influence of smoking on all-cause mortality

The last two columns of table 4.1 and figure 4.4 depict the ASCDRs of all ethnicities, leaving out the smoking-related mortality rate. It can be seen that among the males there are no significant changes in comparison with the total ASCDRs. Moroccans have a significantly lower (non-smoking) ASCDR, native Dutch and Antilleans/Arubans show no significant difference and Turks and Surinamers still have higher ASCDRs than the total Dutch male population. The results do show changes in magnitude, however. The non-smoking ASCDR positive differences of Turks in comparison to the total Dutch population increase by 0.80 deaths per thousand. For Moroccans the negative difference decreases by 1.26 deaths per thousand. Surinamese men show an increase of 0.72 deaths per thousand whereas Antillean/Aruban men shift from a negative difference (0.26) to a positive difference in the number of deaths per thousand.

Among the women there are two significant changes. Surinamers and Antilleans/Arubans now have significantly higher (non-smoking) ASCDRs than the total female population whereas previously they showed no significant differences. The other results differ not in direction. The native Dutch women still show no significant difference and the Turkish and Moroccan women still have lower (non-smoking) ASCDRs. However, it can be noted that the difference between the total female population and the Moroccan and Turkish women has decreased a lot. The yearly ASCDR difference of Moroccan women was first 2.54 deaths per thousand whereas the yearly (non-smoking) ASCDR

difference is now 1.72 deaths per thousand. For Turkish women these differences are 1.08 deaths per thousand compared to only 0.34 deaths per thousand.

Figure 4.4. ASCDRs without the factor of smoking among all ethnic groups, divided by sex, the Netherlands, 2007-11.



Source Data: Statistics Netherlands. Own calculations

5. Conclusion & Discussion

5.1 Conclusion

It was the objective of this paper to give a picture of the all-cause mortality differences of Turks, Moroccans, Surinamers, Antilleans/Arubans and native Dutch in the Netherlands and to ascertain to what extent smoking-related mortality affects mortality differences between these groups.

Moroccan and native Dutch men had lower age-standardised all-cause mortality rates than the total Dutch population of men. For Antillean/Aruban men no differences could be found and Surinamese and Turkish men had significantly higher all-cause mortality rates than the total Dutch male population. For the women, no significant differences could be found for native Dutch and Antilleans/Arubans in comparison to the total Dutch population of women. Of these populations, Moroccan, Turkish and Surinamese women had significantly lower overall mortality rates.

In comparison to the total male Dutch population, native Dutch men had significantly higher age-standardised lung cancer mortality rates and Surinamese, Moroccan, Turkish and Antillean/Aruban men had significantly lower lung cancer mortality rates. For women these patterns were the same. Native Dutch women had significantly higher and Moroccan, Turkish, Surinamese and Antillean/ Aruban women had significantly lower lung cancer mortality rates than the total Dutch population of women.

The patterns of the smoking-attributable mortality fractions among all ethnic groups were naturally quite similar to the ASLCDRs. Native Dutch men had a significantly higher smoking-attributable mortality rate than the total Dutch population and Antilleans/Arubans, Turks, Moroccans and Surinamers had significantly lower smoking-attributable mortality rates. Native Dutch women also had a significantly higher smoking-attributable mortality rate than the Dutch population. Moroccan, Turkish, Surinamese and Antillean/Aruban women all had significantly lower smoking-attributable mortality rates. Furthermore it was striking that men had higher smoking-attributable mortality rates than women for all ethnic groups separately.

The ASCDRs without the effects of smoking generally show that the relative mortality levels of non-western migrants rise. Surinamese and Antillean/Aruban women show significantly higher mortality rates compared to the normal ASCDRs, in which they showed no difference with the total female population. Despite the relatively worse non-smoking ASCDRs of non-western ethnicities, only the Surinamese, Turkish men and Antillean/Aruban women have significantly higher mortality rates, indicating that also without the factor of smoking the health level of non-western immigrants is generally quite decent.

5.2 Discussion

Especially the low ASCDRs of Moroccans is striking in comparison to the total population and the other ethnic groups. This could be (partly) due to relatively younger older age categories. The number of Moroccans in the age category 80+ rose with 130% from 349 in 2007 to 892 in 2011. For the age category 75-80 this amount rose with 131% from 978 to 2255. On the other hand, the age category 80+ of the total Dutch population only rose with 11%. This implies that the Moroccans in the last age categories are relatively younger than other ethnicities and that they naturally have smaller chances of dying. Still this effect only explains part of the mortality differences between Moroccans and other ethnicities. As shown in the theoretical framework, Bos et al. (2004) also found that for the period 1995-2000 the all-cause mortality among Moroccan males was lower than that of native Dutch, Surinamers, Turks and Antilleans/Arubans.

In comparison to the total Dutch population all researched non-western ethnic groups had a lower smoking-related mortality. For men, these results do not correspond with research by Garssen and van der Meulen (2007). They state that in the period 2002-2006 Turkish men had a higher rate of lung cancer deaths (which are almost directly related with smoking-related mortality) than native Dutch men. For women, these results do correspond with other Dutch research. Previous research has also indicated that men have far worse smoking-related mortality rates than women.

Furthermore, it is striking that Moroccan and Turkish females have very low figures of smoking-related mortality. For Surinamese women, the smoking-related mortality is highest after that of the native Dutch women, whereas for Surinamese men smoking-related mortality is the lowest of all researched ethnicities.

This research has not yet made clear that Dutch policy makers should mainly focus on native Dutch ethnicities in reducing the impact of smoking. It is also not yet the case that policy makers should focus more on men than on women. This is because of the cigarette epidemic theory discussed in the theoretical framework (Lopez et al., 1994). As different ethnicities may live or have previously lived quite separated from each other, they could be in different stages of the cigarette epidemic. It could be the case that the popularity of smoking caught on later in various non-Western ethnicities, setting in motion the cigarette epidemic in a later stage. Whether integration of the non-Western ethnic groups in the Netherlands results in a faster movement through the cigarette epidemic is also not clear. The lag effect of cigarettes on health also plays an important role in the cigarette epidemic. The relative share of smokers among non-western ethnicities could be higher than the results of this paper suggest. It could also be the case that the native Dutch smokers smoke relatively less than the results suggest, as smoking-attributable mortality levels of Dutch women is quite high compared to the non-Western ethnicities, suggesting that the arrival in stage four of the cigarette epidemic theory has already taken place, in which the smoking prevalence decreases for both males and females.

Although the level of smoking-related deaths is quite low among women, the actual number of smoking women could be higher. This could also be the case for a specific ethnicity in relation to the Dutch. However, the differences in smoking behaviour between all ethnicities could also be part of a healthy migrant effect. Blue and Fenelon (2002) already claimed that they found such an effect in the United States for the Hispanics. As migrating people are on average usually considered to be innovative, courageous and socially more skilled, it could also have a positive effect on their lifestyle behaviour. If this is the case policy makers are justified in mainly targeting native Dutch citizens for their anti-smoking policies.

A limitation of this research is that this research assumes the same degree of susceptibility of smoking-related illnesses among all ethnicities. This need not be the case. Khlat (1995) found for instance that the susceptibility of lung cancer was lower for Moroccan smokers in France and Australia than their host populations.

5.3 Recommendations for further research

Further research could pay more attention to the oldest age categories of non-western ethnicities, as these age cohorts could contain younger populations than other ethnicities and therefore have less chances of dying. Furthermore, there could be surveys on smoking prevalence among different ethnicities nowadays as the effects of smoking are mainly visible after a few decades after becoming a smoker. Leest et al. (2002) showed for example that smoking was on the rise among young Turkish women as opposed to the older Turkish women. Also the effect of alcohol, illicit drugs and overweight, possibly in connection with smoking could be an aim of research for the largest non-western ethnic groups and native Dutch.

Unfortunately, research on smoking-related mortality is not saturated soon. Smoking still has a large impact on the overall mortality in the Netherlands. Because new periods will arise where smoking-related mortality differences among different ethnicities differentiate from this period, research on smoking-related mortality should be continued until smoking does not have a significant impact on to the health of the Dutch citizens.

The overall conclusion is that in spite of the relatively higher non-smoking ASCDRs of all non-western ethnicities the general pattern is that most of the researched non-western ethnic groups still need not worry too much about their mortality levels in relation to the native Dutch.

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