Risk Health Behaviour Patterns in Germany. Results from the German Health Update 2009

Introduction

Lifestyle related risks are known to have a strong impact on health. Material living conditions as well as individual behaviour have positive or negative effects on human health (Mielck 2000; Kistemann & Meyer 2007). It is considered that by leading a healthier life style chronic diseases are possible to reduce (Shikany and White 2000; Kim et al. 2004). Health outcomes depend on many other factors, like environmental pollution, use of public health services, but a very important factor also is the lifestyle (Kistemann & Meyer 2007). The definition of health lifestyle given by Cockerham et al (1997) says: "collective patterns of health-related behaviour based on choices from options available to people according to their life chances".
An important issue in public health is that one has to aim at preventing rather than treating a disease. Focusing on the risks to health is the key to prevention. Population-based strategies aim to make healthy behaviour a social norm, thus lowering risk in the entire population. Small shifts in some risks in the population can translate into major public health benefits (WHO 2002).
In our study we are going to investigate the health risk behaviour of people and try to outline differences in the behaviour in the German population. We are going to aggregate single health behaviours in order to identify distinctive behaviour patterns. We then examine the demographic and health features of the respondents and discuss the possible reasons for the different behaviour patterns.

Background

There are relatively many studies dealing with different aspects of health-risk behaviours. However, there is not an established criterion or definition of health-risk behaviour. Most of the existing studies take into account different measures related to diet, physical activity, alcohol, smoking, and obesity. McCracken, Jiles and Blanck (2007) investigate for the US population risk behaviours such as eating poor (fewer than five times fruits and vegetables per day), being physically inactive and smoking. In a study, comparing European trends, van der

Wilk and Jansen (2005) investigate the lifestyle-related risks constructed on the basis of the variables for smoking, alcohol consumption, physical activity, obesity, and food consumption. Schneider et al. (2009) are using four different measures to identify health behaviour pattern by cluster analyses for the population of the federal state of Baden-Wuerttemberg, Germany aged 50 to 70 years old. They also use measures for regular tobacco use, excessive alcohol consumption, unhealthy diet and physical inactivity.

Karvonen et al. (2000) study the patterns of health-related behaviour of young people in Finland and Switzerland. As a measure for health-related behaviours they use the main "intake" behaviours – eating, drinking and smoking. They also use cluster analysis and define three patterns – healthy, unhealthy and mixed pattern.

Most often, in the existing studies on risk health behaviour, a lifestyle index is constructed. However, there is not a standard index, researchers usually use different approaches. Kim et al (2004) have constructed a lifestyle index related to four major lifestyle factors. They integrate a composite measure of diet quality and an individual component index of physical activity, smoking, and alcohol consumption. A study conducted by Kirkegaard et al. (2010) is investigating the influence of a healthy lifestyle index on the risk of colorectal cancer. The authors use a lifestyle index which is based on physical activity, waist circumference, smoking, alcohol intake, and diet. Similarly, in a study, investigating the connection between education and lifestyle (Drieskens et al. 2010) the authors construct a lifestyle index from dichotomous variables for smoking, risk alcohol use, physically active and healthy diet. Another study, dealing with healthy behaviours and cardiometabolic risk. (Kwasniewska at al. 2010) construct a lifestyle index on four elements: non-smoking, healthy weight, adequate fruit and vegetable consumption, and satisfactory leisure-time physical activity level.

WHO (2002) defines the most risky health behaviours in global perspective. For our study we make a selection of four lifestyle risk and we take into account the daily consumption of fruits or vegetables, sport activity, smoking and risky alcohol consumption. In the data section we describe in detail the construction of the variables.

The choice of the health risk behaviours is also in consistency with the previous research and is known to have a strong impact on the health outcomes for the individuals. Unhealthy practices like smoking tobacco, high-fat diets, excessive alcohol consumption, a lack of exercise, and similar negative health habits are underlying causal factors for many chronic diseases (Cocherham 2007). WHO (2002) reports that *low fruit and vegetable intake* is estimated to cause about 19 % of gastrointestinal cancer and about 31 % of ischaemic heart disease and 11 % of stroke worldwide. *Physical activity* reduces the risk of cardiovascular

disease, some cancers and type 2 diabetes. It may also reduce the risk of colon cancer and breast cancer. Physical activity can improve musculoskeletal health, control body weight, and reduce symptoms of depression. *Smoking* causes substantially increased risk of mortality from lung cancer, upper aerodigestive cancer, several other cancers, heart disease, stroke, chronic respiratory disease and a range of other medical causes. Among industrialized countries, where smoking has been common, smoking is estimated to cause over 90 % of lung cancer in men and about 70 % of lung cancer among women. In addition, in these countries attributable fractions are 56 – 80 % for chronic respiratory disease and 22 % of cardiovascular disease. Besides the direct effects of intoxication and addiction resulting in *alcohol use disorders*, alcohol is estimated to cause about 20 – 30 % of each of the following worldwide: oesophageal cancer, liver cancer, cirrhosis of the liver, homicide, epilepsy, and motor vehicle accidents. For male in Eur-C, 50-75% of drowning, oesophagus cancer, epilepsy, unintentional injuries, homicide, motor vehicle crashes, and cirrhosis of the liver are attributed to alcohol. However, low-to-moderate alcohol consumption combined with non-binge patterns of drinking has beneficial relationship with coronary disease, stroke and diabetes mellitus (WHO 2002).

Objective

In the current study we want to analyse the health risk behaviour of the population in Germany. We want to underline that we do not study health lifestyles, which are defined to be a product of complex interplay between health related behaviour, orientations and social resources (Abel et al. 1999). We outline the risk behaviour patterns in the population and investigate the possible reasons for people to behave they do. We describe the characteristics of the people and discuss differences of people' behaviour according to demographic and social characteristics, as well as some health variables. We discuss the most important influences on the health related behaviour of people and try to outline the most risky groups in the population. We then discuss the implications of our findings for the public health policies and preventative interventions.

Data and Methods

The empirical analysis is based on the data from the German Health Update 2009 (Gesundheit in Deutschland Aktuell, GEDA). The survey gathers data on public health topics, divided in

different modules. It is a part of a nationwide health monitoring system and is conducted by the Robert Koch Institute in Berlin (Kurth et al. 2009). The German Health Update started in 2003 and since then has been conducted annually (RKI 2005; RKI 2010). We use the data from the GEDA 2009 survey, in which the field work was carried out from July 2008 to June 2009. The sample size consists of 21 262 respondents aged above 18.

Data acquisition was conducted via computer-assisted telephone interview (CATI) by trained interviewers. A telephone number sample, which was created according to the design described by Gabler and Häder (2002), was used as the basis for the examined sample. The recruiting of the interview participants was done by the last-birthday method (O'Rourke and Blair, 1983; Salmon and Nichols, 1983). GEDA is a representative sample for the adult resident population which can be reached by landline phones and speaks German language.

The cooperation rate at respondent level according to the standard definitions from AAPOR (AAPOR 2011) is 51,2%. Moreover, weighting factors were used in order to make the study population comparable to the general population in Germany. The weighting factors were calculating by taking into account the population structure according to age, gender, educational status, regions, household size and number of telephone numbers per household.

The survey contains data on different health aspects of the population such as chronic diseases, vaccinations, mental health, health related support and stress, subjective health, and health-related behaviour variables. For our analysis we use the data on smoking habits, risk alcohol consumption, sport inactivity and unhealthy nutrition.

Variables

- smoking habits

We use the information on the smoking habits of the population obtained through the question: Are you smoking – no matter if regularly or occasionally? (Answer categories are: yes, daily; yes, occasionally; not any more; have never smoked). We make a dichotomous variable indicating if the respondent is currently smoking (no matter if regular or not) or not smoking.

- risk alcohol consumption

For defining the risk alcohol consumption, we use the standard of Alcohol Use Disorder Identification Test Consumption (AUDIT-C) described first at Bush et al. (1998). The indicator is constructed from different questions on alcohol consumption – how often one drinks alcohol, how much on those occasions and the frequency of excessive drinking (binge drinking) on one occasion. A categorical variable is then formed from which are derived the

never-drinkers, the moderate drinkers and the risk alcohol consumption (RKI 2010). For our analysis we take a binary variable indicating if the respondent has a risk alcohol consumption or not.

- sport inactivity

As a measure for the sport activity, we use the question: "Think about the last three months. Have you done sports?". We have a binary variable indicating if the respondent has done some sport in the last three months or not.

- unhealthy nutrition

GEDA 09 contains information on vegetable and fruit consumption by the respondents. The questions on the frequency of vegetable and fruit consumption (separate questions for vegetable and fruits) are with four answer categories: Every day; Minimum once per week; Less than once per week; and Never/Don't know. For our analysis we make a binary variable indicating if the person consumes every day fruits or vegetables.

Cluster analysis

Cluster analysis techniques are concerned with exploring data sets to assess whether or not they can be summarized meaningfully in terms of a relatively small number of groups or clusters of objects which resemble each other and which are different in some respects from the objects in other clusters (Everitt et al. 2001). In general, cluster analysis is considered to be an exploratory data-analysis technique. Clustering methods are intended largely for generating rather than testing hypotheses. (Everitt 1993: 10).

We use hierarchical cluster analysis in order to define the number of different groups of risk behaviour among the German population. We use Ward method as this is considered to be the most suitable for binary variables (Finch, 2005).

An important step of the cluster analysis is to define the number of groups or clusters. There are many different rules of defining the number of clusters one should use in his analysis, but there is a lack of consensus (Everitt, 1993). Informal and subjective criteria, based on expertise, seems to be the most common approach used by scientists (Baxter 1994; Gordon 1999)

For defining the final number of clusters in our analysis we have used the coefficients (quadratic Eucledian distance) from the Ward method, defining the distance between the clusters, and studied their graphic presentation through struktrogramme and dendrogramme.

The final number of cluster is estimated with the method of k-means, which is repeated with differently sorted data set. The final clusters are tested with ANOVA analysis and additional

plausibility check on the basis of different factors not included in the clusters, such as demographic characteristics.

Results

The argument for clustering is that combinations of the four most important and prevalent health risk factors are more detrimental to people's health than would be expected from the addition of the individual effects alone (Poortinga 2007). With the help of the cluster analysis we identify five main groups of health risks behaviour. In Table 1 we present how the clusters are defined and which risk behaviour groups are formed.

Table 1: Distribution of the variables within the clusters

Clusters	% of total	Sport inactivity	Smoking	Unhealthy nutrition	Risk alcohol consumption
1	28,0%	0,0%	0,0%	0,0%	0,0%
2	14,6%	100,0%	0,0%	0,0%	0,0%
3	12,3%	39,5%	100,0%	0,0%	0,0%
4	17,6%	44,5%	39,5%	100,0%	0,0%
5	27,5%	31,5%	38,6%	29,8%	100,0%
	N=20951				
Total average		36,1%	29,9%	25,9%	27,5%

Cluster 1 – 'healthy behaviour'

The first cluster comprises 28 % of our sample. This cluster we can define as the healthy one. All the individuals who are grouped in this cluster do not smoke, do not have risk alcohol consumption, do regularly sports and eat daily vegetables or fruits.

Cluster 2 – 'healthy behaviour, but no sport activity'

Another 15 % of our respondents are grouped in Cluster 2. It can be defined as a healthy cluster with no sport activities. People who are classified in this group are having a healthy diet, do not smoke, do not have risk alcohol consumption, but also 100% of them do not practice any sport.

Cluster 3 – 'smoking'

This cluster consists of 12 % of the total sample and has the smallest size of all the five clusters. All of the individuals grouped in this cluster are smokers. Additionally, they do not have risk alcohol consumption and all of them have healthy nutrition and consume daily vegetables or fruits. However, about 40 % of them do not have sport activities, that is similar to the average in Germany.

Cluster 4 – 'unhealthy nutrition and no risk alcohol consumption'

About 18 % of the respondents in our sample are grouped in cluster 4. People classified here are having unhealthy nutrition habits - all of them do not consume daily vegetables or fruits. Additionally, about 45 % of them do not do any sports and about 40 % are smokers. The alcohol consumption in this group is not risky, if they drink alcohol, it is in moderate quantities. This cluster we can also define as a cluster with multiple risk behaviours – 43 % of the people in this cluster have two risk behaviours (unhealthy nutrition and either no sport activity or smoking). About 20 % of the people in this cluster have three risk behaviours simultaneously – they have unhealthy nutrition, do not do sports and smoke.

Cluster 5 –'risk alcohol consumption with other risk behaviours'

Almost 28 % of the sample is grouped in cluster 5. The peculiarity for this cluster is that all of the individuals have risk alcohol consumption. Additionally, about 40 % of the people are also smokers, which is about 10 % more than the average for the population. A relatively high part of the cluster has also bad nutrition habits and do not daily consume vegetables or fruits. About 32 % of the people in this cluster also do not practice any sport. As a whole, this cluster seems to combine at most multiple risk behaviours. About 40 % of the people have two risk behaviours and a bit more than 20 % have three risk behaviours. Six percent of the respondents have four risk behaviours simultaneously, that is, they are smokers, have risk alcohol consumption, do not do sport and have unhealthy nutrition. Estimated for the whole sample, four simultaneous risk behaviours have 1,6 % of our respondents.

To understand further the differences between the people from each cluster, we have a look at the basic socio-demographic characteristics of the individuals from each group (Table 2).

Table 2: Clusters of risk health behaviours and further socio-demographic characteristics

	Healthy behaviour		Sport inactivity		Smoking		Unhealthy nutrition		Risk alcohol consumption		Total	
	%	95 % CI	%	95 % CI	%	95 % CI	%	95 % CI	%	95 % CI	%	
Sex												
Men	37,9	(36,3 - 39,5)	37,7	(35,1 - 40,2)	45,7	(43,1 - 48,3)	58,5	(56,4 - 60,6)	59,7	(58,1 - 61,2)	48,5	(47,6 - 49,4)
Women	62,1	(60,5 - 63,7)	62,3	(59,8 - 64,9)	54,3	(51,7 - 56,9)	41,5	(39,4 - 43,6)	40,3	(38,8 - 41,9)	51,5	(50,6 - 52,4)
Age group												
18 – 29	15,3	(14,3 - 16,5)	5,8	(4,9 - 6,9)	18,0	(16,2 - 19,9)	19,9	(18,3 - 21,6)	23,8	(22,6 - 25,2)	17,4	(16,7 - 18,0)
30 – 44	24,9	(23,6 - 26,2)	18,5	(16,8 - 20,3)	32,5	(30,2 - 35,0)	32,8	(30,8 - 34,8)	24,8	(23,4 - 26,2)	26,2	(25,4 - 26,9)
45 – 64	33,6	(32,1 - 35,1)	25,3	(23,2 - 27,4)	38,7	(36,2 - 41,2)	32,0	(30,0 - 34,0)	31,9	(30,4 - 33,4)	32,2	(31,5 - 33,1)
65 +	26,2	(24,7 - 27,8)	50,5	(47,9 - 53,1)	10,8	(9,1 - 12,8)	15,3	(13,6 - 17,2)	19,5	(18,1 - 21,0)	24,1	(23,4 - 25,1)
Social status												
Low	15,6	(14,2 - 17,1)	30,1	(27,5 - 32,8)	22,3	(20,0 - 24,9)	23,4	(21,4 - 25,6)	15,6	(14,2 - 17,2)	20,0	(19,2 - 20,9)
Middle	59,2	(57,6 - 60,7)	57,1	(54,5 - 59,7)	61,3	(58,8 - 63,8)	61,1	(59,0 - 63,3)	60,9	(59,3 - 62,5)	60,0	(59,1 - 60,8)
High	25,2	(24,1 - 26,4)	12,8	(11,5 - 14,2)	16,3	(14,9 - 17,9)	15,4	(14,2 - 16,7)	23,5	(22,3 - 24,7)	20,0	(19,5 - 20,6)

The ‘healthy behaviour’ cluster is a “women’s” cluster – about 62 % of the people in this group are women. Also, they come from the older age groups – the two last groups (45 – 64 and 65+) are overrepresented. They have significantly higher percent of people coming from the higher social status group than it is average for the population.

The ‘healthy behaviour, but no sport activity’ cluster also consists mostly of women (62%), coming mainly from the older age groups - 51 % are aged 65 and above. They are also significantly more people coming from the low social status group.

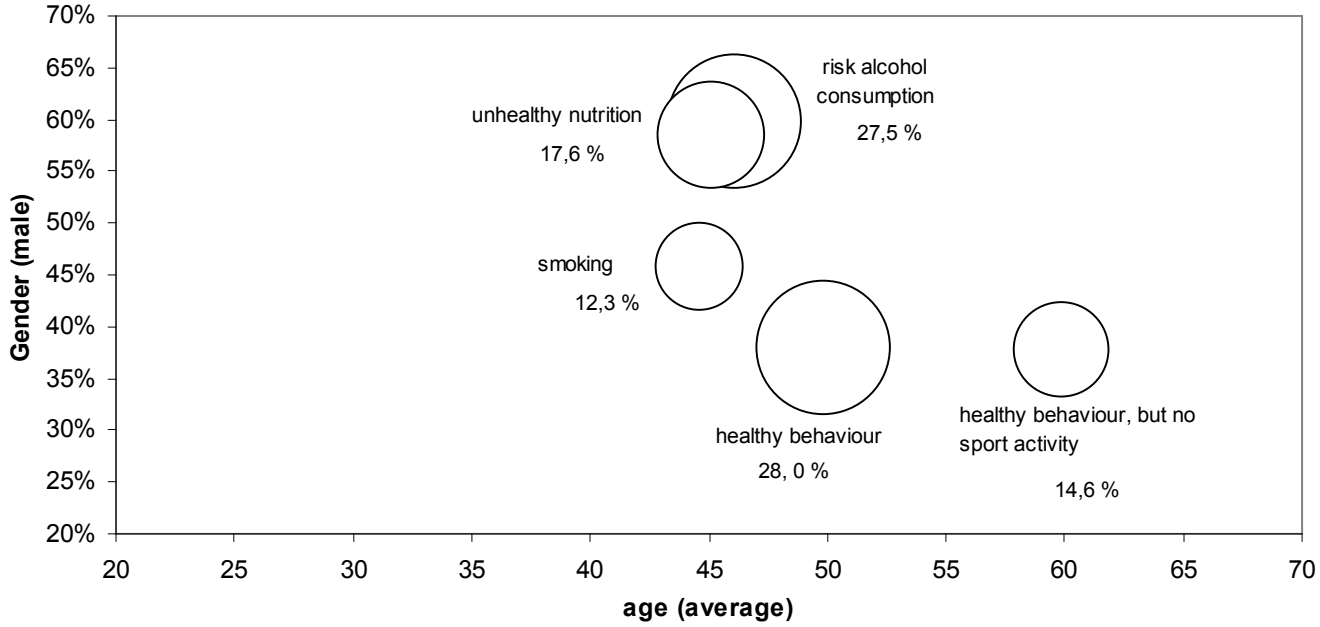
The cluster of the smokers consists of 46% of men and 54% of women. They are also mostly from the middle ages – the groups between 30 and 65 year-olds are overrepresented. There are differences according to the social status. In this cluster there are significantly less people coming from the high social status group.

The cluster of ‘unhealthy nutrition’ consists to 59 % of men. They are also predominantly younger people, having higher percent of people than the average coming from the age groups 30 – 44. People in this cluster have significantly more often lower social status compared to the total average.

The ‘risk alcohol consumption’ cluster consists to 60 % of men. Additionally, people in this group are predominantly young – about 24 % are in the age group 18 to 29 years old. Additionally, there is a higher percentage of people coming from the higher social status group.

As a whole, the differences according to gender distribution, education level and social status in each of the clusters are significant. The differences according to age groups are also observed, although they are not always significant. Inevitably, there is a high dependence between age and gender in the clusters. In order to visualize the distribution of the clusters, we plotted the five clusters according to age and sex (Graph 1). Here the relationship between age and gender between the different clusters is very well visible.

Graph 1: Description of the clusters according to age and sex



The two healthiest clusters ('healthy behaviour' and 'healthy behaviour but no sport activity') consist predominantly of women. There is a significant difference according to age - in the 'healthy behaviour' cluster people are largely from the middle aged groups while in cluster 'healthy behaviour but no sport activity' are concentrated mostly people from the older age groups. The 'smoking' cluster consists of middle age people, with approximately equal distribution of men and women. The last two clusters ('unhealthy nutrition' and 'risk alcohol consumption') consist predominantly of men in the middle age groups.

In order to be able to define further characteristics of the people in the different behaviour clusters, we looked at the distribution of each cluster according to additional health and demographic characteristics (Table 3).

The 'healthy' cluster has a big part of people who define their health status as good or very good. Only in the risk alcohol consumption cluster are observed more people with good or very good subjective health and the differences with the total and the other clusters are significant. The people with chronic diseases are 39,6 % which is very near to the total average (39, 1%). There are significantly less people with physical limitations in this cluster, as well as people with adipositas. According to employment status, the results show a bit lower part of people in this cluster, compared to the average, that are at the moment employed. People in this cluster also characterise with significantly higher percent of living with partner and having higher social support.

Table 3: Clusters of risk health behaviours and further socio-demographic characteristics

	Healthy behaviour		Sport inactivity		Smoking		Unhealthy nutrition		Risk alcohol consumption		Total	
	%	95 % CI	%	95 % CI	%	95 % CI	%	95 % CI	%	95 % CI	%	
Subjective health												
Good/very good	75,3	(73,7 - 76,7)	50,7	(48,1 - 53,3)	68,6	(66,1 - 71,1)	69,5	(67,3 - 71,6)	77,6	(76,1 - 79,0)	70,4	(69,5 - 71,2)
Middle/bad	24,7	(23,3 - 26,3)	49,3	(46,7 - 51,9)	31,4	(28,9 – 33,9)	30,5	(28,4 – 32,7)	22,4	(21,0 – 23,9)	29,6	(28,8 - 30,5)
Chronic diseases												
Yes	39,6	(38,0 - 41,2)	52,9	(50,3 - 55,5)	37,8	(35,3 - 40,4)	35,9	(33,8 - 38,0)	33,8	(32,3 - 35,4)	39,1	(38,2 – 40,0)
No	60,4	(58,8 - 62,0)	47,1	(44,5 - 49,7)	62,2	(59,6 - 64,7)	64,1	(62,0 - 66,2)	66,2	(64,6 - 67,7)	60,9	(60,0 - 61,8)
Physical limitations												
Yes	27,7	(26,2 - 29,2)	48,6	(46,0 - 51,2)	30,7	(28,3 - 33,1)	28,1	(26,1 - 30,2)	24,8	(23,3 - 26,3)	30,5	(29,7 - 31,4)
No	72,3	(70,8 - 73,8)	51,4	(48,8 - 54,0)	69,3	(66,9 - 71,7)	71,9	(69,8 - 73,9)	75,2	(59,3 - 62,5)	69,5	(68,6 - 70,3)
Adipositas												
Yes	13,6	(12,4 – 14,9)	26,3	(24,0 - 28,8)	15,1	(13,1 - 17,2)	15,6	(14,0 - 17,3)	13,6	(12,5 - 14,9)	16,0	(15,3 - 16,7)
No	86,4	(85,1 – 87,6)	73,7	(71,2 - 76,0)	84,9	(82,8 - 86,9)	84,4	(82,7 - 86,0)	86,4	(85,1 - 87,5)	84,0	(83,3 - 84,7)
Employment status												
Never employed	5,8	(5,0 – 6,7)	4,8	(3,7 – 6,3)	2,8	(2,1 – 3,7)	4,5	(3,7 – 5,5)	5,1	(4,4 - 5,8)	4,8	(4,4 - 5,2)
Earlier employed	38,7	(37,1 – 40,3)	60,9	(58,5 – 63,3)	29,2	(26,9 – 31,7)	29,7	(27,7 – 31,9)	31,5	(30,0 - 33,2)	37,3	(36,4 - 38,2)
At the moment employed	55,5	(53,9 – 57,1)	34,2	(32,0 – 36,6)	68,0	(65,5 – 70,4)	65,7	(63,6 – 67,9)	63,4	(61,7 - 65,0)	57,9	(57,0 - 58,8)

Living with partner												
Yes	72,5	(71,1 – 73,9)	69,3	(66,9 – 71,6)	68,8	(66,6 – 71,0)	66,1	(64,1 – 68,0)	65,1	(63,6 – 66,6)	68,5	(67,7 - 69,2)
No	27,5	(26,1 – 28,9)	30,7	(28,4 – 33,1)	31,2	(29,0 – 33,4)	33,9	(32,0 - 35,9)	34,9	(33,4 - 36,4)	31,5	(30,8 - 32,3)
Social support												
Low	13,7	(12,6 – 15,0)	23,1	(20,9 – 25,6)	16,5	(14,6 – 18,6)	21,4	(19,5 – 23,4)	13,0	(11,8 – 14,3)	16,6	(15,8 - 17,3)
Middle	50,5	(48,8 – 52,1)	50,7	(48,0 – 53,3)	48,3	(45,7 – 50,9)	52,6	(50,4 – 54,8)	51,3	(49,7 – 53,0)	50,8	(50,0 - 51,8)
High	35,8	(34,3 – 37,4)	26,2	(24,0 – 28,5)	35,2	(32,8 – 37,7)	26,0	(24,2 – 27,9)	35,7	(34,1 – 37,2)	32,6	(31,8 - 33,4)

People from the ‘sport inactivity’ cluster have the highest percent who define their health as bad – almost half of them do so. In comparison, the average in our sample is almost 30 %. In this cluster people also significantly more often have chronic diseases – about 53 %, the highest compared to all the other clusters. People with physical limitations are also significantly more than in any other cluster – 48 % report they are physically limited. Additionally, people with adipositas are also significantly more than the total average or any other cluster – the percent of people with adipositas is 26 %. In this cluster we also observe a significantly high percent of people who were previously employed – 61 %. This observation can be related to the age distribution. We earlier described that this cluster is relatively ‘old’ and that is why it could consist to a high extend of people in pension. The percent of people living with a partner is very similar to the total average. In this cluster we also find there is a significantly high percent of people who report to have low social support.

People who come from the ‘smoking’ cluster have subjective health very near to the total average. The percent of people with chronic diseases, physical limitations or adipositas is also on average level and do not differ from the total. In this cluster we observe significantly higher percent of people who are currently employed. This, again, may be connected with the age distribution in this cluster which consists of higher percent of people from the middle age groups. The percent of people form this cluster that live with a partner is very similar to the average. Also, there is a bit higher percent of people with higher social support, though not statistically significant.

The ‘unhealthy nutrition’ cluster does not show any differences from the total with respect to the subjective health of the respondents. People in this cluster have significantly less chronic diseases (36 % compared to 39 % in the total) and slightly less physical limitations (28 % compared to 30 %). The percent of people with adipositas is also very similar to the total average. According to employment status, the results show that there is significantly less people that were previously employed and more people currently employed. As we saw already, this cluster has a higher percent of people in the ages between 18-44 and obviously this structure is reflected in the employment status. People in this cluster have slightly higher percent that do not live with partner and significantly higher percent of people with low social support.

The riskiest health behaviour cluster ‘risk alcohol consumption’ has the highest percent of people who define their health as very good or good – 78 % do so. This is significantly different from the total and all the other clusters except for the ‘healthy’ one. This cluster has also the lowest percent of people with chronic diseases, physical limitations and adipositas

and this is also significantly different from the total. A considerably high percent of the people in this cluster are currently employed, live without a partner and have high social support.

Discussion

The definition of the risk behaviour clusters in our analysis to high extend is overlapping with the results of Schneider et al. (2009). They use similar variables and identify five homogeneous health behaviour groups defined as No Risk Behaviours, Physically Inactives, Fruit and Vegetable Avoiders, Smokers with Risk Behaviours and Drinkers with Risk Behaviours. These groups are very similar to the ones we obtained, although the population under study in Schneider et al. (2009) is only adults aged 50 to 70 years.

Almost a third from our respondents leads a healthy lifestyle. People with such behaviour are predominantly women from the older age groups with very good subjective health, les physical limitations and adipositas, and high social support.

As the results show, the 'sport inactivity' cluster is actually a healthy cluster, except for the sport performance. In our analysis we found out that people in this cluster have significantly worse subjective health status, have more chronic diseases and physical limitations. It could be that people in this cluster have healthy lifestyle attitudes but are physically limited or diseased to perform regular sports activity. Other possibility is that people who are seriously diseases and physically limited can not afford themselves to perform bad health behaviours like risk alcohol consumption or smoking. In any case, this cluster is an example that the behaviour of people can be driven by certain (disease) limitations rather than by cultural, traditional or other factors. We consider that the health status of the people serves as a barrier towards physical activity.

Similar conclusions have also made Rütten et al. (2007). They also find in their cluster analysis that social disadvantage per se is not the reason for adopting a sport inactive behaviour. There are many other factors influencing the performance of sport, such as having friends, time, and having a disease. In any case, the empirical research shows that there are not really many people who regularly exercise and have bad health status (RKI; 2008).

So, one of the conclusions we can do here is that the 'sport inactivity' cluster can be considered as a healthy behaviour cluster. The respondents here have healthy behaviour but too high percent of chronic diseases and physical limitations. Altogether, this would mean that 43 % of the German population actually leads a healthy behaviour life.

The cluster of the ‘smokers’ is a cluster that has very similar proportions as in the total sample. Slightly more women, more people from the middle age groups and higher employment percent are the only differences that are observed from the total. All the health variables are comparable to the total sample. All in all, this cluster consists of healthy people who don not do sport and smoke, but have a good nutrition habits and do not show risk alcohol consumption.

The ‘bad nutrition’ cluster consists predominantly of men in young and average age groups in very good health conditions, less chronic diseases and physical limitations, active on the labour market, having lower social support and coming from the lower social strata. This cluster is highly selective and should be recognised as a risk population group.

The last cluster, consisting of the most combinations of risk behaviours is representing about 28 % of our sample and it also contains a highly selective group of people. The cluster consists of young men from the high social strata who have a very good health status, few chronic diseases and physical limitations. They are employed, have high social support and about 35 % of them do not live with a partner. Positive relation between income status and high alcohol intake is also found by Pomerleau et al. (1997). Additionally, this cluster combines at most multiple risk behaviours, which shows that alcohol consumption is highly correlated with other risk behaviours such as smoking, no sports and unhealthy nutrition. Ma et al (2000) also find that excessive alcohol use is more common among smokers.

All in all, we consider that people from the cluster gathering multiple risk behaviours are obviously in good shape, feel well and can afford them risky health behaviour. Evidence for such trends and similar results are also given in other studies. Schuit et al. (2002) find a strong relation between smoking and alcohol consumption in the youngest age groups and among subjects who perceive their health as very good or excellent. They attribute these results to the possible high degree of self-conscience among young adults. They also conclude that healthy people do not experience the risks associated with an unhealthy behaviour. Furthermore, a study by Backett and Davidson (1995) revealed that young people consider that it is boring, un-youthful or middle-aged to be so future oriented as to worry about health lifestyles and chronic illness.

In our cluster groups we found out that the health risk behaviour is strongly determined by age and gender while the influence of the social class was not sufficiently well defined. The riskiest health behaviour groups had higher percent of men in middle age groups. Research shows, for instance, that the most important predictor of fruit and vegetable consumption is gender (Friel et al. 2004). The authors find out that for females matters the socio economic

factors while for males a combination of socio-economic and social support-type factors (marital status, employment status) are predictive factors for fruit and vegetable consumption.
In our analysis we were able to define the risk health behaviour groups among the German population. We saw that each of the group has certain characteristics that differ it from the other groups. We also found that 1,6 % of the respondents had all four healthy risk behaviours, with a bit higher percentage for men (2,6 %) than for women (0,8 %). These results are pretty much consistent with a study conducted in Finland, where 2,4 % of men had all four unhealthy behaviours and 0,9 % of the women (Laaksonen et al 2001).
The dependence of one risk behaviour on another risk behaviour is much discussed in the literature. For instance, Chiolero et al (2006) state that clustering of multiple risk behaviours is increasing strongly and steadily with daily cigarette consumption in both men and women for the case of Switzerland. In the case of USA, Ma et al (2000) also find that smokers consume more meat and other high fat foods, and less fruit, vegetables and grains while exercisers tend to smoke less and drink more than non-exercisers.
From other studies we know, that multiple health risk behaviour is more common among low educated people (Drieskens et al., 2010; Pomerleau et al., 1997), singles, unemployed and with low income (Roberfroid & Pomerleau, 2001; Poortinga, 2007). In turn, multiple healthy lifestyle factors among adults are found to be strongly associated with high education, no chronic diseases and age group 50 to 64 (Pronk et al. 2004). Chiolero et al (2006) also find that clustering of risk behaviours is frequent, and more frequent in men than in women. Furthermore, smokers and teetotalers tend to be younger, less educated and have lower incomes (Ma et al., 2000).

Conclusions

Our results showed that health behaviour patterns are influenced by many demographic factors of the individuals, but also by health and social factors. We argue that the health behaviour of the people is to highly extend driven by the health conditions of the individuals – the healthiest they feel, the riskier behaviour they have. According to us, good health conditions and young ages together with gender are the most important preconditions for risky health behaviours. The role of the social status stays unrevealed in the current analysis. When we compare the two riskiest behaviour clusters, we see that in one of them there is a high percent of people from the low social status group, but in the other one – high percent of

people from the high social status group. The influence of the social status, thus, stays undefined as there are mixed influences.

We assume that people change their risk health behaviour with the time. Young people may be more unaware or more inexperienced in possible health consequences and 'dare' more to adopt unhealthy behaviour. But as they age, more health problems may appear or the awareness may become bigger and as a result people may change their behaviour towards healthier lifestyle. According to Backet and Davidson (1995), the health behaviour is a part of dynamic and interactive processes of daily living. The change of the health behaviour over the lifecourse of the individuals involves looking backwards over previous experience and anticipating future experience often in terms of stereotypical realities.

Schuit et al. (2002) also argue that people are more likely to change their behaviour if it leads to short-term effects, like feeling fit, that if it leads either to intermediate (overweight) or long-term effect (coronary heart disease). In consistency with our results we consider that public health preventive programs should aim at explaining the young populations of the long-term consequences that certain risk behaviours may have. The aim should be to achieve high health awareness and consciousness of the young population.

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