

Is ‘Oranje’ a health risk for Dutch retirees?

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Introduction

Entering retirement is known to be a significant break in life, above all for men (George *et al.*, 1984). The so-called ‘third age’ entails negative as well as positive developmental processes as retirement provides the chance to find a new orientation, after life was for decades determined by occupational commitments (Kim and Moen, 2001). This includes, among others, allocating more time to social contacts, concentrating on new hobbies and deepening old interests (Gauthier and Smeeding, 2003). Typical for men is an enhanced devotion toward the support of their favourite sport team. On the one hand, it seems plausible that identification with a successful team provides happy moments with positive effects on life satisfaction and health. For instance, it was reported that in France mortality from myocardial infarction was significantly lower on the day when the French football team won the World Cup in 1998 (Berthier and Boulay, 2003). On the other hand, however, devotion to a rather unsuccessful team could have detrimental effects on health and wellbeing. In fact, Witte *et al.* (2000) showed that all-cause mortality as well as mortality from coronary heart disease and stroke was significantly increased among Dutch men aged 45 years and older after their team was eliminated from the European Football Championship in 1996. This finding is worrisome as improvements in mortality in the Netherlands lag already behind the general trends in Western Europe (Luy *et al.*, 2011) and, moreover, the recent performances of the Dutch football team have not given reason for optimism regarding forthcoming tournaments. The aim of this contribution is therefore to test the findings of Witte *et al.* (2000) by analysing mortality in the Netherlands in relation to the eliminations of the Dutch national football team from the World Cups and European Championships since 1996. A special focus is given to retirees as their number continues to increase in the course of the actual ageing of European populations (see Van Nimwegen, 2013).

Data and methods

I used mortality data from Statistics Netherlands (Centraal Bureau voor de Statistiek) comprising the age- and sex-specific number of deaths by day for the periods of major football events since 1996. These include the FIFA World Cups in 1998, 2006, and 2010 and the UEFA European Championships in 2000, 2004, and 2008. I analysed all-cause mortality of women and men for the age groups 45-64, 65-79, 45+, 65+ and 80+ during the 11-day periods around the days at which the Dutch team was eliminated (see *table 1*). The periods include the day of the game plus the five preceding and following days. Relative risks for each day related to the 11-days average with 95 per cent confidence intervals were calculated. The population at risk was derived from the Human Mortality Database.¹ In addition, I compared the data with those from the corresponding periods in the years before and after the six included football tournaments. The 2002 World Cup and the European Championship of 2012 had to be excluded because the Dutch team failed to qualify for the former and lost all three first

¹ Available at <http://www.mortality.org> (data downloaded on October 29, 2013).

Table 1. Eliminations of the Dutch national football team from FIFA World Cups and UEFA European Championships (EURO), 1998-2010

Event	Day	Round	Opponent	Result
1998 World Cup	July 7	Semi-final	Brazil	2-4 (penalties)
2000 EURO	June 29	Semi-final	Italy	1-3 (penalties)
2004 EURO	June 30	Semi-final	Portugal	1-2
2006 World Cup	June 25	Round of 16	Portugal	0-1
2008 EURO	June 21	Quarter-final	Russia	1-3 (extra time)
2010 World Cup	July 11	Final	Spain	0-1 (extra time)

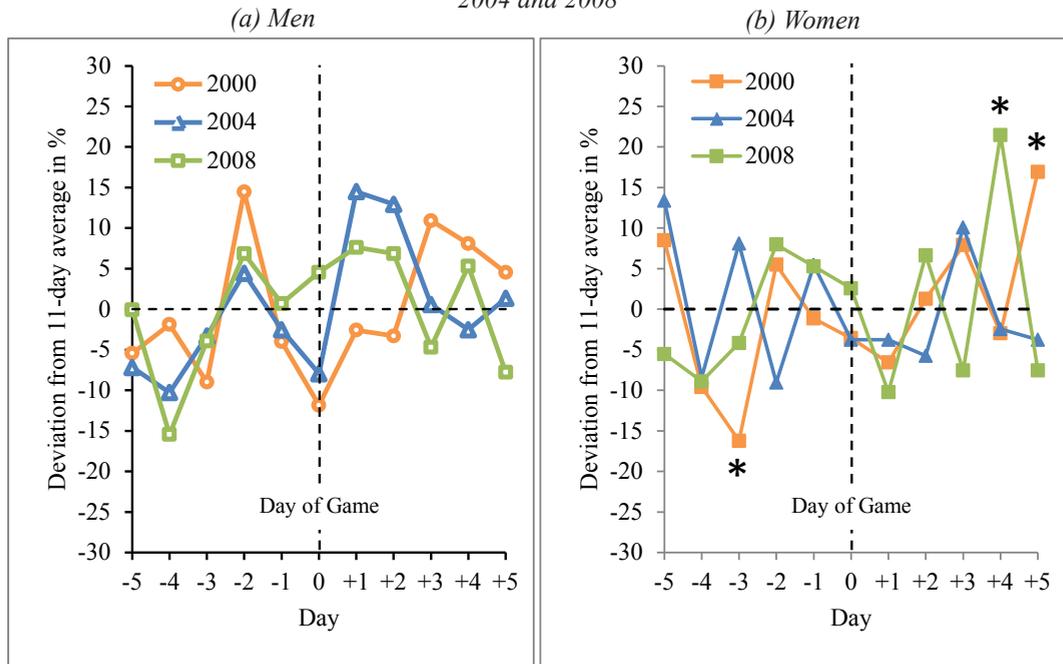
round games of the latter. Because these games took place within only eight days it was not possible to analyse independent 11-day periods around each of the defeats during the most recent tournament.

Results

Figure 1 shows the deviation of the daily number of deaths at age 65 and older (in per cent) from the 11-day averages around the days of elimination of the Dutch national football team from the UEFA European Championships in 2000, 2004 and 2008. Among men (*figure 1a*) it appears that mortality increased on the first few days after the games, whereas the day of the game itself seems to be characterised by comparatively low mortality. The increase peaked during the European Championships of 2004 and 2008 at the days after the games and during the 2000 tournament at the third day after the Dutch team was eliminated. However, none of these observations is statistically significant. A noticeable increase of all-cause mortality was expected after the elimination of the Dutch team from the European Championship in 2000 which took place in the Netherlands and Belgium. The expectation of supporters towards their own team is always especially high in ‘home tournaments’. Consequently, the lost semi-final against Italy in Amsterdam should have caused higher stress for the ‘Oranje fans’ than the other defeats. This was not the case, however. Statistically significant increases of mortality on the 95 per cent confidence level after the eliminations of European Championships can be found only among Dutch women (*figure 1b*). This occurred five days after the Dutch team’s defeat in 2000, and four days after the elimination in 2008. However, the defeat in the semi-final against Portugal in 2004 was not associated with an increase of women’s mortality in the Netherlands.

The corresponding results for the eliminations from the FIFA World Cups in 1998, 2006 and 2010 are displayed in figure 2. Among men (*figure 2a*), a statistically significant excess in mortality can only be found for 2006 when the Dutch team lost against Portugal in the round of the last 16. However, the mortality increase peaked as late as five days after the game, following a statistically significant decrease of mortality on the first day after the defeat. The significant mortality increase five days before the game in which the Dutch team was eliminated speaks also against an increased risk of death as a consequence of lost games. This day (June 20, 2006) was between the third game of the group stage against Argentina

Figure 1. Deviation of number of deaths at ages 65+ from 11-days average around days of elimination of the Dutch national football team from the UEFA European Championships in 2000, 2004 and 2008



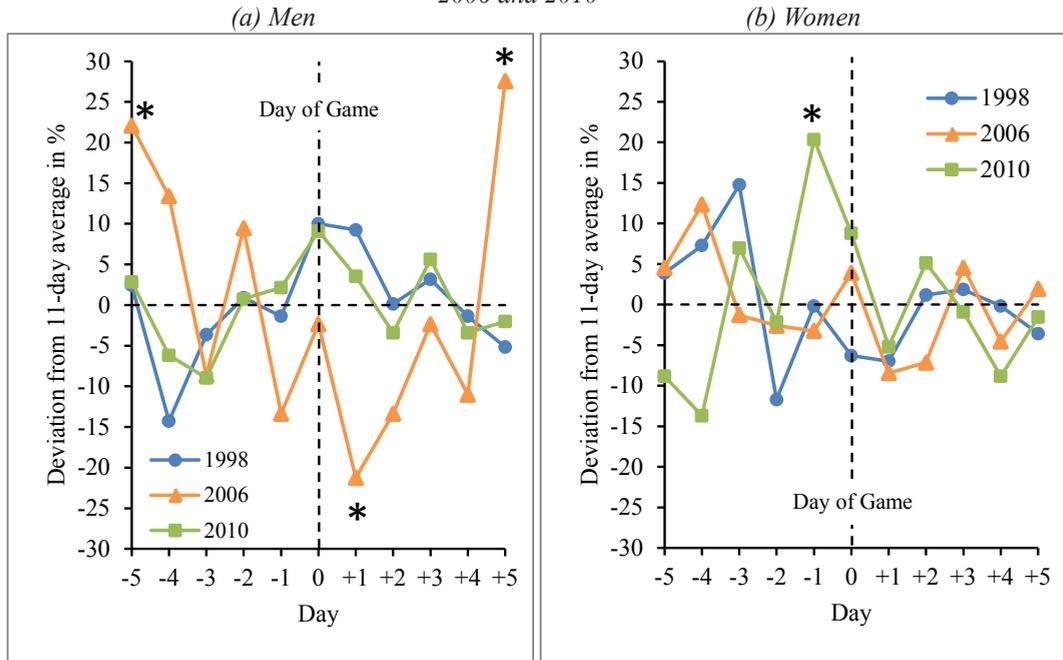
Notes: Day 0 = Day of game (see table 1); *statistically significant observations ($p < 0.05$).
Source: Own calculations.

on June 21 (0-0) and the 2-1 victory against Ivory Coast in the second game on June 16 through which the Dutch team achieved early qualification for the round of the last 16. During the World Cups of 1998 and 2010, mortality of Dutch men appears to peak on the days when their football team was eliminated as described by Witte *et al.* (2000) for the 1996 European Championship. However, none of these results is statistically significant. Not even the dramatic 0-1 defeat in extra time against Spain in the final of the 2010 World Cup had a notable effect on the mortality of Dutch men. The pattern of female mortality during the same periods does also not show any sign of increased mortality after eliminations of the Dutch football team. The only statistically significant excess in mortality occurred one day before the final in 2010.

Discussion and conclusions

The aim of this contribution was to replicate the analysis of Witte *et al.* (2000), who showed that among Dutch men (but not among women) all-cause mortality as well as mortality from coronary heart disease and stroke increased on the day when the national football team lost the semi-final against France on a penalty shootout. The present study which is based on a larger number of observations including three World Cups and three European Championships does not provide support for these findings. This holds true for all performed analyses including

Figure 2. Deviation of number of deaths at ages 65+ from 11-days average around days of elimination of the Dutch national football team from the FIFA World Cups in 1998, 2006 and 2010



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Source: own calculations.

the age groups 45-64, 65-79, 45+, 65+ and 80+. Even the probably most stressful events for Dutch football fans –i.e. the defeats in the semi-final of the European Championship 2000 at home and in the final of the 2010 World Cup– did not increase male mortality from all causes in the Netherlands. Furthermore, I could not detect any specific effect for defeats in the regular time of the game, in extra time or in penalty shootouts. Also the round of the tournament in which the elimination occurred seems to have no influence on all-cause mortality. The few statistically significant increases of mortality after the Dutch football team was eliminated appear to occur rather arbitrary as I found a similar number of days with excess mortality during the corresponding periods in the years before and after the championships (data not shown). Likewise, statistically significant deviations below the averages of the analysed 11-day periods occur to a similar extent.²

² I analysed additionally the mortality in the 11-day period around the defeat of the Dutch football team against Ireland on September 1, 2001 when the Netherlands definitely failed to qualify for the World Cup in 2002. Among men, the pattern of mortality around this day looks similar to the results for the eliminations from European Championships (figure 1a). However, significant effects could only be found for the age groups 45-64 and 45+ on the fourth and fifth day after the game. Among women, a significant increase of all-cause mortality occurred only on the second day after

These results for all-cause mortality do not exclude that mortality due to specific conditions was increased as it is known that great sport events are “afflicted with an [...] enormous emotional strain for certain groups of spectators” with consequential effects on cardiovascular health (Baumhäkel *et al.*, 2007: 152, for pathophysiological details see Leeka *et al.*, 2010). In this respect, the results reported by Witte *et al.* (2000) were confirmed in other studies. Carroll *et al.* (2002) showed that in England the risk of admission for acute myocardial infarction increased by 25 per cent on the day the English team lost against Argentina in penalties in the round of the last 16 of the World Cup in 1998. Katz and colleagues analysed sudden cardiac deaths in Switzerland during the 2002 World Cup and also out-of-hospital cardiac arrests during the 1998 FIFA World Cup and found evidence for increases in both cases (Katz *et al.*, 2005, Katz *et al.*, 2006). An investigation of changes in the rates of cardiac emergencies in Bavaria (Germany) during the World Cup of 2006 revealed a 2.7-fold increase in the incidence in the 12 hours before and after the football games involving the German team (Wilbert-Lampen *et al.*, 2008). Moreover, Kirkup and Merrick (2003) found that on days when local football teams from northern England lost at home, male mortality attributable to myocardial infarction and stroke increased significantly. This study followed the fortunes of the football clubs Newcastle United, Sunderland AFC, Middlesbrough FC and Leeds United for five years over which time the findings remained consistent.

Other studies, however, failed to detect corresponding effects of specific football games. For instance, Barone-Adesi *et al.* (2010) did not find an increase of admission for acute myocardial infarction among the Italian population on the days of football games involving Italy during the World Cups of 2002 and 2006 and the European Championship in 2004. Toubiana *et al.* (2001) re-analysed the same game as Witte *et al.* (2000) from the French perspective. They found no effects on all-cause mortality as well as mortality from myocardial infarction and stroke in France, who were the winners of this quarter-final of the 1996 European Championship. Jauss *et al.* (2009) challenged the results of Wilbert-Lampen *et al.* (2008) as they did not find any increase in cerebrovascular events in Hesse during the games with German involvement in the 2006 World Cup. Also an investigation carried out in Australia could not detect any sign of increased stress and health problems in association with watching big football events (Bauman *et al.*, 2006). It is important to note, however, that the studies summarized here are hardly comparable. They differ substantially in the number of exposure days evaluated, the control period selected, the extent to which other variables were adjusted for, the definition of the outcome and the method used for the analysis (see also Hoek, 2010).

To conclude, I cannot confirm the results of Witte *et al.* (2000) that supporting the Dutch national football team is a notable health risk for men in the Netherlands. It seems that watching the games of the national football team is rather a riskless activity for Dutch retirees. Brunekreef and Hoek (2002) arrived at the same conclusion in their replication of the Witte

the game in age group 45+. I also analysed the period June 4-17, 2012 including the three defeats of the Dutch team in the first round of the most recent European Championship. In accordance with the presented results, no conclusive pattern of all-cause mortality could be detected. Not even the defeat against archrival Germany caused an elevated peak in the number of daily deaths.

et al. study for five major football games of the Dutch national team between 1988 and 1994, however without providing information about the analysed age group and with no separation between women and men. According to the results obtained in the present study it seems that for women, the days after the lost games are characterized by below-average mortality (see figures 1b and 2b). Speculation about the causes of this phenomenon exceeds the scope of this article. Future research might target the question whether the behaviour of Dutch men on the days after the defeats is to some extent stress reducing for their wives. For men themselves, however, these frustrating events have no effect on all-cause mortality at the day of the game and the following days. It seems therefore not necessary to medicate the entire male population with beta blockers during the days around important football games as suggested by McCrory (2005). Nevertheless, it would not harm to follow the alternative advices outlined by Čulić (2011), including a before-the-game and clear-minded consideration of the possibility that the Dutch team may lose and avoidance of concomitant triggers, in particular alcohol, cigarettes and illicit drugs.

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