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The effect of a health promotion campaign on mortality in children

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Abstract

Previous research has shown that in the Netherlands there is a certain degree of preventable mortality associated with long-distance travel, particularly among children of ethnic minority descent. In 1985 a health promotion campaign was launched in Amsterdam with the aim of reducing travel-related deaths by increasing knowledge in ethnic minority communities about the risks involved in travel. In the present study, two data sets are used to examine the possible effects of this health promotion campaign on travel-related mortality in children. The first data set, which was collected locally, indicates that the number of Amsterdam children dying abroad has dropped considerably since 1985. This is particularly true within one group which is highly likely to exhibit risky travel behavior. The second data set, which was collected nationally, shows that an upward trend in mortality among children aged 0–14 years before 1985 has in fact changed into a downward trend since 1985. A similar pattern is observed in the Netherlands as a whole, but to a significantly less pronounced degree than in Amsterdam. Although the influence of extraneous factors can never be fully dismissed, the analysis provides support for the conclusion that the health promotion campaign did in fact succeed in reducing the number of travel-related deaths.

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Introduction

The high mortality among children of foreign descent living in the Netherlands has long been a cause of concern (Uniken-Venema *et al.,* 1995; Schulpen, 1996; Steenbergen *et al.*, 1997, 1999). In the age group 0–14 years, children born of parents from countries such as Morocco, Turkey, Surinam and the Netherlands Antilles show mortality rates two to three times higher than those of Dutch children of the same age. Research has shown that an important proportion of the excess mortality among minority children takes place outside the Netherlands (van der Wal *et al.*, 1996; Steenbergen *et al.*, 1999).

In the early 1980s, research was carried out in order to learn more about the circumstances surrounding mortality in children registered in Amsterdam and aged 1 week to 14 years (van der Wal *et al.*, 1996). Doctors and nurses from the Child Health Care department of the Municipal Health Service Amsterdam interviewed parents and teachers about the circumstances related to children's deaths. The results show that many deaths are associated with people living in Amsterdam who are of foreign descent and travel 'back home' for holidays. Infectious diseases and accidents are important causes of death during these journeys. Most problems associated with holiday mortality appear to be preventable, and are related to poor preparation and low levels of knowledge and awareness of possible problems during long-distance travel. For example, there are low levels of travel immunization and few hygienic precautions; sometimes little is done to ensure the use of clean water and well-prepared food. In most cases death

results from an accumulation of problems, e.g. children may acquire a relatively innocent gastrointestinal infection which then has serious consequences because of the exhaustion and dehydration caused by long car journeys and lack of proper care. It is important to note that these problems are not caused by a careless attitude on the part of the children's parents. Many travelers of foreign descent do not realize that while they themselves are going 'home', their children are in fact entering an alien environment and being exposed to previously unknown risks. It is estimated that approximately 12% of the total mortality among Amsterdam children and 25–35% of mortality among children from ethnic minorities can be explained by deaths during travel abroad (van der Wal *et al.*, 1997).

The study of travel-related mortality led to the organization of a health promotion campaign to improve knowledge and travel practice among citizens of foreign descent living in Amsterdam. This campaign started in 1985 and continues to date. The campaign consists primarily of agency work and it is difficult to provide a good overview of the resources invested. Organizations and individuals active in community development and preventive health care, including departments of the Municipal Health Services, are given training, assistance and support in providing ethnic minority clients with advice and materials. Materials and initiatives are developed continuously in order to meet the specific needs of the participating organizations and their clients. In addition to national initiatives, such as those organized by the National Institute for Health Promotion and Disease Prevention, the health insurance companies and the national motoring association, a considerable amount of work is carried out in the form of activities organized by local bodies. The Youth Health Service, the health promotion department of the Municipal Health Service and 'El-samra', a group which works with women from ethnic minorities, are particularly active. The aim of the campaign is to increase and improve travel immunization and knowledge of basic hygiene, and to ensure that travelers go abroad well 'equipped' for emergencies and capable of avoiding the major hazards of travel. Since 1985 a vast number of health promotion techniques have been employed, in accordance with international recommendations (Fisher, 1998; James, 1998). First, a special parents' and children's travel clinic was set up and additional MMR and BCG vaccinations are now offered to parents of children below the age of 1 year who are likely to travel. Secondly, when visiting child health and 'well baby' clinics, parents are informed about travel risks by doctors, nurses, and multilingual and multicultural health educators. Thirdly, travel safety is now an important topic during health promotion activities in settings such as community centers, mothers' groups, 'well woman' groups and preventive health clinics. Most of these activities are targeted at women from ethnic minority groups; however, recently the target group has been widened to include men from ethnic minorities as well. Finally, a multilingual video and brochures are available for instruction purposes, and this material is updated regularly. In general, the campaign to increase knowledge about travel behavior is considered a success, judging from the response of parents and community leaders. One particularly positive result is the fact that children and parents from ethnic minorities now constitute an important proportion of those applying for travel immunization (particularly against hepatitis and typhoid) and advice at the Municipal Health Services; in the past they were rare visitors.

This paper will endeavor to establish whether the campaign to improve travel practice among ethnic minority groups living in Amsterdam has accomplished its aim of lowering mortality rates among children living in Amsterdam. In contrast to what is often the case in health promotion, the 'subjects' of this travel campaign are not cynics who have heard it all before, but responsible parents living in a new country and trying to adapt to new circumstances. In this group, health-related information is held in high esteem. It should therefore be possible to observe the effects of the health promotion campaign in terms of a decrease in child mortality in Amsterdam. For the purpose

of this study, two questions related to two bodies of data were developed; both of these questions were aimed at establishing the degree of effectiveness of the health promotion campaign. The question we asked with regard to the set of data collected locally was: to what extent has the mortality of Amsterdam children in foreign countries decreased since the start of the health promotion campaign and how is this related to various travel patterns? Using a data set collected nationally, according to international norms, we compare child mortality in Amsterdam and in the Netherlands as a whole. In view of the fact that the health promotion campaign was specifically aimed at residents of Amsterdam and that Amsterdam has a relatively high proportion of children of foreign origin amongst its inhabitants, we expect that changes will be more pronounced in Amsterdam than in the Netherlands as a whole.

Data

The first set of data analyzed was collected locally by the Municipal Youth Health Services (MYHS). The MYHS is responsible for preventive health activities and health screening in children living in Amsterdam who are between 1 week and 18 years old. Children younger than 1 week are cared for in hospitals or by community nurses. The MYHS is informed by local and national authorities of any known deaths among the children for whom they are responsible. The MYHS also screens mortality in its area by means of extensive collaboration with community nurses, general practitioners, and educational and social services. A community nurse visits the parents of a child who has died at an age between 1 week and 4 years old; the deaths of older children are discussed with parents or schoolteachers. In this way an extensive database has been built up which provides detailed information about cause, place and circumstances of children's deaths. Of the children registered as deceased in the MYHS system, 95.5% are also recorded as deceased in the municipal population registry while 98.6% of children registered as deceased in the population registry are registered as such by the MYHS (van der Wal *et al*, 1996). Data for the period 1982–1994 is available and a comparison of the period 1982–1984 with the period 1985–1994, considering place, cause and circumstances of death, is therefore possible. The main disadvantage of the MYHS data is that it is limited to Amsterdam and that no data from before 1982 is available.

The second set of data involved consists of national data based on death certificates. This data provides considerable detail as to causes of death and is in line with international standards. In this paper the focus of interest is on the categories infectious diseases (ICD9: 001–139) and ill-defined causes (ICD9: 780–799). The category 'ill-defined' is used when a death certificate is absent, which is usually the case if a child has died outside the Netherlands. Among those dying of 'infectious diseases' in the Netherlands there is a sizeable group of people who have died after being infected abroad. Both in the Netherlands and internationally, imported infectious diseases constitute an important category. Often these diseases are found in the migrant population (Brabin and Ganley, 1997; Riordan, 1998; Klein and Millman, 1998; Termorshuizen and van der Laar, 1998). In this study we analyze data for the period 1975–1995 and examine whether trends for 1975–1984 are different from trends for the period 1985–1995. This data also makes it possible to compare changes in mortality in Amsterdam and the Netherlands as a whole. Differences in trends before and after 1985, and differences between Amsterdam and the Netherlands as a whole, could confirm the effectiveness of the health promotion campaign. The national data has a number of advantages, such as the fact that the data is publicly available, and is compiled according to very high and internationally accepted standards. However, it also has serious drawbacks. The data provides little information as to the demographic backgrounds of the deceased and no information on the circumstances surrounding the deaths. Moreover, the data tends to change as (international) needs and definitions change.

The data was analyzed using SPSS, GLIM

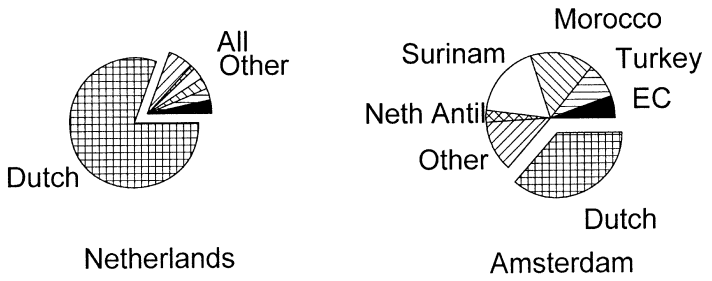

Fig. 1. Nationality groups in the Netherlands and Amsterdam for 1992 and age 0–14 years.

Table I. *Number of deaths among children resident in Amsterdam by place of death and period of death: three likely travel pattern categories*

Travel category	Place of death	No. before 1985 (%)	No. after 1985 (%)	Total 1982–1996
Local	Netherlands	106 (96.4)	306 (97.8)	412 (97.4)
	abroad	4 (3.6)	7 (2.2)	11 (2.6)
Overland	Netherlands	46 (58.2)	160 (79.2)	206 (73.3)
	abroad	33 (44.0)	42 (20.8)	75 (26.7)
Long-distance	Netherlands	13 (92.1)	121 (90.3)	134 (90.5)
	abroad	1 (7.1)	13 (9.7)	14 (9.5)
Total	Netherlands	165 (81.3)	587 (90.5)	752 (88.3)
	abroad	38 (18.7)	62 (9.5)	100 (11.7)

and the Internet-based calculator SISA (http://home.clara.net/sisa).

Results

Figure 1 presents a breakdown of the population of Amsterdam and the population of the Netherlands as a whole for the age group 0–14 years for 1992 and for a limited number of nationality groups. National origin or descent, the usual way of establishing migrant status which is often used as a proxy for ethnicity, is measured in Amsterdam on the basis of place of birth of the individual or the parents while at the national level it is measured on the basis of nationality. A comparison between national and local data is available for 1992 (Centraal Bureau voor de Statistiek, 1995). As can be seen in Figure 1, citizens of non-Dutch origin form a much larger section of the population in Amsterdam than in the Netherlands as a whole.

Table I shows the data on deaths among children aged between 1 week and 14 years of age as collected by the MYHS. The data is cross-tabulated by a number of 'travel groups', the place of death (in the Netherlands or abroad) and whether the death took place before or after 1985. There are three 'travel groups'. The first consists of 'locals': children of Dutch or north-western European descent (mostly German, British and Belgian). The second is the 'overland' group: children from Southern and Eastern Europe, Turkey and Northern Africa. The third is the 'long distance' group, children originating from the sub-Saharan African countries, Asia and South America. This classification is based on the different likely holiday travel patterns of these three groups. The 'locals' have quite a diverse holiday pattern; in the case of families, holidays will relatively often be local. The 'overland' group will probably go on holiday less frequently than the locals, but if they do, they will tend to travel long distances. In the case of families, where travel cost is an important factor, this group will often travel by car. The 'long

distance' group will go on holiday even less frequently, but if they do, they will often travel by plane.

As Table I shows, most deaths, 423, are among children classified as 'local' in their travel behavior; however, only a very small proportion of deaths in this group, 2.6%, occur abroad. The 'overland' group is the group with the second largest number of deaths, 281, and in this group a high proportion of deaths, 26.7%, occur abroad. The 'long distance' group has the smallest number of deaths, 148; in this group 9.5% of deaths occur abroad.

An important difference can be observed between the data from before and after 1985, the year the health promotion campaign was started. As can be seen in the bottom row, the proportion of deaths abroad decreased from 18.7 to 9.5%. This decrease is statistically significant ($t = 3.1$; d.f. = 277; $P = 0.01$). The results were slightly strengthened in a log-linear analysis where age and sex were kept constant ($t = 3.4$; d.f. = 275; $P = 0.01$). The log-linear analysis also showed that the change was more pronounced among girls compared with boys, but the difference between boys and girls in the pattern of change was not significant. The proportion of deaths abroad in the 'overland' group decreased even more dramatically, from 44.0% to 20.8% ($t = 3.7$; d.f. 120; $P < 0.01$). When age and sex were kept constant, a similar result was obtained ($t = 3.4$; d.f. 118; $P < 0.01$). In the 'local' group there is also a slight decrease, while in the 'long-distance' group there is an increase in the proportion of deaths abroad. The changes are not statistically significant in either of these last two groups.

Table II presents an overview of the MYHS mortality data by period and place of death. As can be seen, the relative number of deaths occurring abroad due to infectious diseases decreased dramatically. Fisher's exact test (single-sided cumulative $P = 0.02$) shows that this decrease is statistically significant. In 11 of the 18 children who died abroad from an infectious disease, diarrhea and abdominal complaints were reported. Meningitis may have been present in some cases, since high fever was reported, but it was never explicitly mentioned. In 29 of the 52 children who died in the Netherlands, meningitis was the probable cause; there was only one reported case of diarrhea. There is also a decrease in mortality caused by certain chronic conditions, but this decrease is not statistically significant This is also true of the increase in the categories congenital plus perinatal mortality (ICD9: 740–779) and the decrease in the number of deaths due to unknown causes and to injury. In our data, deaths abroad in the 'injury' category had only three causes: car crashes (70%), plane crashes (20%) and drowning (10%). The data also shows that in this category multiple deaths are often involved. In one particular tragedy in the period before 1985 four children were killed; if this event had been excluded from the analysis, the average yearly number of deaths abroad due to injury would have been smaller before 1985 than after.

Figure 2 shows data collected nationally from children aged 0–14 years. The data refers to the number of deaths per 100 000 children from infectious diseases and unknown causes. These two ICD9 categories were chosen because deaths abroad often fall into these two categories and the effects of the health promotion campaign should be particularly pronounced here. Linear regression lines were set out and a dummy variable coded 0 before 1985 and 1 after 1985 was used to establish whether the health promotion campaign had had an effect on the trend and the incidence of child mortality in Amsterdam. In addition, this data makes it possible to compare trends in Amsterdam and the Netherlands as a whole. The analysis follows the theoretical model suggested by McQueen (McQueen, 1993). In Figure 2 the upper solid line shows the trend for Amsterdam and the lower for the Netherlands as a whole. The points clustered around both lines represent the number of deaths per 100 000 inhabitants in each of the years studied for Amsterdam and the Netherlands. Figure 2 shows that both in Amsterdam and in the Netherlands child mortality in the categories infectious diseases and ill-defined plus unknown causes increased between 1975 and 1984, and that this increase was particularly pronounced in

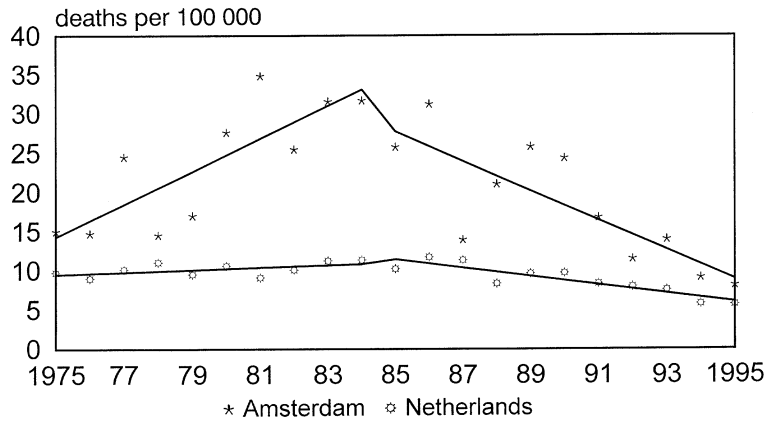

Fig. 2. Mortality in children living in Amsterdam and the Netherlands—changes over time in the prevalence of infectious disease plus unknown causes.

Table II. *Causes of mortality in children aged 1 week to 14 years before and after a health promotion campaign: death abroad and locally (%)*

Period	Place	Infections ICD: 1–139	ICD9: 140–739	ICD9: 740–779	Unknown ICD: 780–99	Injury ICD: 800–999
Before 1985	Netherlands	6 (40.0)	21 (84.0)	29 (100.0)	81 (83.5)	37 (78.7)
	abroad	9 (60.0)	4 (16.0)	0 (0.0)	16 (16.5)	10 (21.3)
Total		15 (100.0)	25 (100.0)	29 (100.0)	97 (100.0)	47 (100.0)
After 1985	Netherlands	46 (83.6)	77 (93.9)	170 (95.0)	201 (92.6)	130 (83.3)
	abroad	9 (16.4)	5 (6.1)	9 (5.0)	16 (7.4)	26 (16.7)
Total		55 (100.0)	82 (100.0)	179 (100.0)	217 (100.0)	156 (100.0)

Amsterdam. When a model was made of possible changes in incidence in 1985, the year in which the health promotion campaign was launched, an immediate effect could be observed: in Amsterdam there is a clear drop in the predicted number of deaths, while in the Netherlands as a whole there is a slight increase. The change in trend was also modeled; this model shows that after 1985 both in Amsterdam and in the Netherlands as a whole the number of deaths declined. The decline is most pronounced in Amsterdam.

Table III presents the regression and other coefficients used for the model in Figure 2. The average increase of 2.08 deaths per 100 000 inhabitants per annum in 0–14 year olds is statistically significant in Amsterdam (2.08; 95% CI 1.10/3.10), but the average increase of 0.15 deaths per 100 000 per annum in the Netherlands (0.15; 95% CI –0.03/0.33) is not. The difference between the trends in Amsterdam and the Netherlands before 1985 is significant (1.93; 95% CI 0.95/2.91). The immediate decrease of 3.47 deaths per 100 000 inhabitants in Amsterdam after the start of the health promotion campaign in 1985 is not significant, nor is the increase of 0.15 deaths per 100 000 in the Netherlands or the difference between Amsterdam and the Netherlands. After 1985 the number of deaths in both Amsterdam and the Netherlands decreases significantly each year. In Amsterdam the reversal of the trend in the periods before and after 1985 is statistically significant (3.97; 95% CI 2.60/5.34). This is also true for the Netherlands as a whole (0.69; 95% CI 0.46/0.93). The statistically significant reversal of the trend

Table III. *Parameters from a linear regression model for the number of deaths before and after a health promotion campaign: predicted numbers of deaths per 100 000*

Effect	β	95% CI lower	95% CI upper
Amsterdam			
immediate effect	–3.47	–12.09	5.15
trend before intervention	2.08	1.06	3.10
trend after intervention	–1.88	–2.80	–0.96
difference trend before and after	–3.97	–5.34	–2.60
The Netherlands			
immediate effect	1.15	–0.30	2.60
trend before intervention	0.15	–0.03	0.33
trend after intervention	–0.54	–0.70	–0.38
difference before and after campaign	–0.69	–0.93	–0.45
Difference between Amsterdam and the Netherlands			
immediate effect	4.62	–3.57	12.81
trend before intervention	1.93	0.95	2.91
trend after intervention	1.34	0.44	2.24
difference before and after campaign	3.28	1.95	4.61

is more pronounced in Amsterdam than in the Netherlands (3.28; 95% CI 1.95/4.61).

Lastly, the results shown in Table III were re-examined taking possible age effects and gender profile changes into account; for age we used category 0 years against the categories 1–14 years. The estimates did not change much, but with each additional variable the SDs increased. The upward trend before 1985 in Amsterdam (1.69; 95% CI –0.92/4.29) was no longer statistically significant when the children's age and sex were taken into account, and the downward trends after 1985 were no longer statistically significant in Amsterdam (–1.96; 95% CI –4.00/0.08) or the Netherlands (–0.66; 95% CI –1.53/0.21). The reversal of the trend continued to be significant in Amsterdam (–3.65; 95% CI –7.17/–0.13), but not in the Netherlands as a whole (–0.80; 95% CI: –2.16/0.56).

Discussion

In this study two bodies of data concerning mortality among children aged 0–14 years were used to assess the impact of a health promotion campaign aimed at preventing travel-related deaths. Hypotheses were formulated as to changes in child mortality over time. It was predicted that the first set of data would show that after the implementation of the health promotion campaign there was a fall in the number of children dying abroad. This hypothesis was confirmed, particularly for a section of the population which could be expected to travel long distances overland to their holiday destinations. The second set of data consisted of standard, nationally collected mortality data categorized according to the ICD9. It was predicted that this data would show that after the start of the health promotion campaign the number of deaths due to infectious diseases and unknown causes had fallen. It was also expected that the effect would be stronger in Amsterdam than in the Netherlands as a whole, in view of the fact that the campaign had a high exposure in Amsterdam and that a relatively high proportion of citizens in Amsterdam were likely to benefit from the campaign. The analysis showed that after 1985 both in Amsterdam and in the Netherlands a previously upward trend in mortality due to infectious diseases and unknown causes changed into a downward trend. As was expected, the change was significantly more pronounced in Amsterdam than in the Netherlands as a whole.

These results do in fact seem to confirm the

effectiveness of the health promotion campaign. After the start of the health promotion campaign in 1985, child mortality in Amsterdam decreased. In particular, there was a marked fall in the proportion of deaths abroad among nationality groups with a higher risk of child travel mortality. Morbidity among migrant children on returning from holidays in the countries of their parents' origin has also been observed internationally (Klein and Millman, 1989; Brabin and Ganley, 1997; Riordan, 1998). Insufficient travel preparation and inadequate prophylactic measures are mentioned as important factors causing the problems. This study shows that in Amsterdam this problem has been tackled successfully by involving a number of organizations active in community development and preventive health care. Various materials and approaches were used and developed throughout the campaign. Although it would not be easy to replicate the campaign in detail, the general approach of developing various materials, and involving and supporting a number of different groups can be used in any setting and adapted to local circumstances.

Several questions might be raised as to the methodology of this study and the validity of the conclusions. Our aim was not to provide a definitive, 'gold standard' study of the effectiveness of this intervention, such as could be obtained by conducting a randomized controlled trial (RCT). For practical and methodological reasons such a study was not feasible. The cost of an intervention study would have been high, and the time lag between intervention and outcome considerable; it is difficult to evaluate this particular intervention according to a strict design, as it consists of a flexible package of activities carried out in varying circumstances and developed as opportunities arise; and, lastly, no uncontaminated control group is available. One important reason not to conduct an intervention study was that the health promoters and preventive health specialists wanted to get on with tackling the serious public health problem caused by an obvious lack of knowledge in migrant groups about travel safety. Such considerations are common in health promotion research.

We regard this study as an example of triangulation methodology. The triangulation philosophy, often proposed by qualitative researchers (Begley, 1996; Goodman *et al.,* 1996; Nutbeam, 1996), sees validity in research in terms of accumulating evidence by means of multiple methods. It is an inductive process aimed at attaining a holistic reconstruction of reality and there is room for all evidence, be it qualitative or quantitative, descriptive or experimental. In this study, by studying two bodies of data and by asking different questions, we tried to accumulate evidence as to the effectiveness of a health promotion campaign. We believe that the pattern of change one might expect to appear after such a campaign, given the specific circumstances, could indeed be observed. However, triangulation consists not only of accumulating positive evidence but also of answering challenging questions and critical objections.

One question in particular comes to mind that might raise doubts as to the results of this study. To what extent can the results be explained by other factors, e.g. that migrants living in the Netherlands are traveling less often or are using a safer means of transport (plane rather than car)? Unfortunately, there is no detailed information available on the specific travel behavior of migrants. However, if we can accept that migrant travel behavior is not completely different from the behavior of the general population, then there has probably been an increase in travel. For the entire population of the Netherlands, the number of holidays taken abroad was about 4.0 million in 1975, about 5.1 million in 1985 and about 6.9 million in 1995 (Centraal Bureau voor de Statistiek, 1978, 1987, 1997). The main means of transport was the motor car, which was used in 67% of holidays abroad both in 1975 and in 1985, and 60.5% in 1995. Plane travel increased from 15% in 1975 to 16% in 1985 and 23% in 1995. Moreover, the data from the Municipal Health Service shows that deaths due to infectious diseases have decreased most since 1985, whereas injury (primarily the result of car crashes and therefore related to the number of car journeys) continues to be an important cause of death. Thus, although

the travel patterns of migrants living in the Netherlands have probably changed in some aspects, it seems unlikely that a decrease in travel would have had a substantial influence on the conclusions of this study.

Another possible explanation for the conclusions might be that the number of migrants living in Amsterdam has decreased. However, in actual fact almost all nationality groups showed an increase in numbers. Data for children of Turkish or Moroccan descent (the two groups which are probably most at risk of high travel mortality) living in Amsterdam are as follows (Bureau Onderzoek en Statistiek van de Gemeente Amsterdam, 1982, 1985, 1990, 1993): in 1982 there were 14 641 children aged 0–14 who were Turkish or Moroccan nationals or of whom at least one parent was a Turkish or Moroccan national, in 1985, 17 122 such children, and in 1990 and 1993, 20 989 and 23 233, respectively. In 1992 definitions changed. Between 1992 and 1995 the number of children of whom at least one parent was *born* in Turkey or Morocco, or who themselves were born in Turkey or Morocco, increased from 25 621 to 27 499 (Centraal Bureau voor de Statistiek, 1994, 1996).

Another explanation might be that the coding of the causes of death has changed. This would influence the analysis of the national data in particular. An international study has shown that changes in coding practice, both official and non-official, can influence the estimation of trends in causes of mortality (Jansson *et al*., 1997). However, we believe that as the national data was analyzed at a high level of aggregation, i.e. infectious diseases and unknown causes generally, without considering subcategories, the result is probably reasonably stable. There were no changes in the practice of registration for the MYHS data. Lastly, during a long period as observed in this study there are always important changes in the prevalence of diseases and other public health events, and these must have had some influence on the change observed. During the period observed, AIDS/HIV came to the fore as an important infectious disease, roads and cars became safer, the battle against major diseases continued, and in some cases great steps forward were made in public health. It is extremely difficult to assess the influence of these factors in the present study, as it is in all studies of trends over a long period.

To summarize, after the introduction of a major health promotion campaign in 1985, a sizeable reduction was observed in travel-related mortality, particularly mortality due to infectious diseases, among children aged 0–14 years. The evidence that the health promotion campaign played an important part in causing the decrease is circumstantial but strong, even in the light of alternative explanations.

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