ORIGINAL ARTICLE

The influence of local politicians on pedestrian safety

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Aim: To determine whether local politicians influence the distribution of traffic calming measures.**Methods:** Longitudinal ecological study in two UK cities. Local political constituencies were categorized by representation by members of the cabinet structure as a marker of influence. The density of traffic calming features per political area, adjusted for the historical pattern of road injuries, was compared between cabinet represented and non-represented areas.**Results:** Traffic calming density was significantly associated with cabinet representation status, adjusted for historical collision risk (risk ratio 2.77, 95% confidence interval 1.37 to 5.61).**Conclusion:** These results support the hypothesis that senior local politicians are effective advocates for enhancing safety in their areas.

The World report on road traffic injury prevention produced by the World Health Organization and the World Bank described the enormous scale of the global burden of road traffic injuries, with 1.2 million deaths a year and countless millions injured and left with disabilities.¹ Road traffic injuries are already a leading cause of death and disability and their relative importance is predicted to increase substantially in the future.² The burden is particularly great among children and older people, for whom pedestrian injuries account for a high proportion of all traffic related injuries.³

The UK has a generally good road safety record. However, the pedestrian fatality rate per kilometre walked is much higher than in several western European countries, particularly for child pedestrian fatalities.⁴ Pedestrian injuries and fatalities in the UK have decreased during recent years, but this is due partly to decreases in pedestrian exposures. Increasing physical activity is a key component of government strategies to reduce obesity but this needs to be embedded within activities of daily living, such as choosing walking and cycling, rather than driving.^{5–6} Increasing pedestrian activity requires a reduction in the actual and perceived risks of walking, particularly for children. At the moment, many parents consider traffic and “stranger danger” to make walking and playing in the streets too dangerous for their children.⁷

Three main groups of interventions are commonly used to reduce pedestrian injuries; engineering, enforcement, and education. Engineering approaches, and specifically the vertical deflections most commonly used in traffic calming, have substantial potential to reduce pedestrian and occupant injury rates.^{8–9}

A recent UK study demonstrated that concentrating traffic calming in deprived areas was associated with absolute and relative reductions in inequalities in child pedestrian injuries.¹⁰ No previous study has demonstrated the capacity of traffic calming to reduce the large inequality in pedestrian injuries.¹¹ That study demonstrated that different distributions of traffic calming exist in two adjacent cities.¹⁰ The location of traffic calming is likely to be influenced by several issues, including the pattern of injurious road crashes, site suitability for traffic calming, demands for and objections against traffic calming made by local residents, and lobbying by elected politicians representing local communities. The relative influence of each of these factors is unknown. The purpose of this study was to determine whether areas represented by influential local politicians have greater provision of road safety features.

One of the greatest challenges to the global injury prevention community is not discovering whether interventions work or

not but in discovering what factors support or hinder the adoption of effective interventions. There is a need to expand the scope of research from the epidemiology of injury occurrence to the epidemiology of the provision of safety features and interventions. Undoubtedly political influences at different levels have a major impact by deciding upon the share of budgets to be allocated to prevention and on the geographical and social distribution of publicly funded safety measures. However, very little is known about the magnitude or determinants of these influences or how they vary across the world. Findings in one part of the world may well be applicable to many other areas given the tendency for human beings to exhibit similar behavioral patterns.

METHODS

This study follows a longitudinal ecological design in which the units of measurement are electoral wards (also known as electoral divisions or tracts). The hypothesis being tested is that electoral wards represented by influential politicians have a greater than expected amount of traffic calming, having adjusted for historical crash patterns. In the UK local politicians called councillors are elected to local authorities for four year periods to represent electoral wards with populations of approximately 5000 per councillor. Each electoral ward is represented by at least one local councillor. Many councillors are re-elected and serve long periods of office.

Identifying influential councillors has been extremely difficult as there are no readily available objective metrics for influence. Local authorities provide a wide variety of services to populations of 100 000 to 500 000. The 2000 Local Government Act reorganization created a basis for cabinet structures within local authorities and some councils introduced this style of governance before the Act came into place.¹² In local authorities in the UK cabinets are comprised of members of the party or parties with most representatives sitting on the council. It is a reasonable assumption that those selected for cabinet were, in the past, more influential than their colleagues. The website of each local council was used to identify which electoral wards had been represented by a cabinet councillor at any point since 1995. Both cities were controlled by the same political party during the time period of this study.

This hypothesis that cabinet councillor status could be used as a marker for past and present influence was tested by comparing whether the areas they represented had higher

Abbreviations: GPS, global positioning satellite; GIS, geographical information system; TCF, traffic calming feature.

Table 1 Distribution of collisions, casualties, and traffic calming features (TCFs) by cabinet member representation status from 1992–2000

		All roads		Minor roads	
		Represented	Not represented	Represented	Not represented
Total length of road (km)		407.6	1108.8	358.2	937.5
Total TCFs		605	839	594	799
TCFs per km		1.5	0.8	1.7	0.9
All casualties		Number	Rate/km	Number	Rate/km
	1992–94	2511	6.2	6050	5.5
	1995–97	2285	5.6	5760	5.2
	1998–00	1942	4.8	5174	4.7
Pedestrian casualties		Number	Rate/km	Number	Rate/km
	1992–94	590	1.5	1155	1.0
	1995–97	461	1.1	971	0.9
	1998–00	394	1.0	854	0.8
All collisions		Number	Rate/km	Number	Rate/km
	1992–94	1926	4.7	4567	4.1
	1995–97	1743	4.3	4355	3.9
	1998–00	1442	3.5	3785	3.4
Pedestrian collisions		Number	Rate/km	Number	Rate/km
	1992–94	566	1.4	1124	1.0
	1995–97	447	1.1	934	0.8
	1998–00	380	0.9	814	0.7

traffic calming densities than those represented by non-cabinet colleagues, having adjusted for potential confounders. The installation of traffic calming became the responsibility of local councils following the Traffic Calming Act of 1993.¹³ Conversations with traffic engineers in both areas indicated that actual installation began in the mid 1990s, with the pace of installation increasing substantially during the late 1990s. By 2002, sufficient features had been installed to detect statistically significant differences between areas. However, neither council carried detailed information on the installation date of each feature in easily accessible computerized files.

The major measurable potential confounder is the historical incidence density of road collisions. This study is an extended analysis of traffic calming in small areas of two UK cities.¹⁰ Briefly, the locations of traffic calming features were mapped across two cities using a walk and drive survey of all roads in the spring of 2002. Handheld global positioning satellite (GPS) technology was used to identify grid references of traffic calming, prior to transfer to a geographical information system (GIS). Grid references are 12 digit numbers with six positions each for the easting and northing components which identify a location anywhere in the world to a one metre square resolution. Transferring the grid references to a GIS is necessary to determine in which electoral ward and on which type of road the feature is located. Road lengths and types (minor or major roads) were obtained from an official UK Ordnance Survey product called Meridian.¹⁴

In the UK, road traffic collisions which result in at least one injury are reportable to the police and are documented in the STATS 19 form and subsequently computerized. STATS 19 data were obtained from the UK data archive for the period 1992–2000.¹⁵ Grid references contained within the accident record were then used to map crash locations using the GIS to assign each crash to the electoral ward in which it occurred.

The total number of collisions resulting in at least one casualty, the total number of casualties, and the numbers of pedestrian collisions and casualties per electoral division were calculated for the periods 1992–94, 1995–97, and 1998–2000. Three year aggregations are a recommended method for analysing STATS 19 data since they represent sufficient cases to detect statistically significant differences and because they are less likely to be susceptible to fluctuations in traffic patterns or area treatments.¹⁶ We also carried out analyses based on the entire 1992–2000 period.

The relation between the incidence density of road collisions with at least one injury and the density of traffic calming simplifies to the ratio of the number of traffic

calming installations to the number of injurious collisions, since the denominator of both incidence rates is the same—that is, the road length within each electoral division. Analysis of variance was used to compare log transformed ratios between cabinet and non-cabinet represented electoral divisions, testing for interaction between cities. A modified log transformation of the form $\log(10x+1)$ rather than $\log(x)$ to avoid problems caused by taking a log of zero.

Analyses were carried out on both the number of injurious collisions and the number of casualties. Models were also created for minor roads to account for the fact that the majority of incidents occur on these roads and that these are best suited to traffic calming interventions.

It is worth summarizing the time frames of the various sources of data used in the analyses based on the descriptions and decisions taken for each data source discussed above. The number of traffic calming features in 70 electoral wards in two cities in 2002 was related to whether or not each ward had been represented by a councillor who had been a member of the cabinet structure any time between 1995 and 2000, adjusting for historical collision and injury patterns between 1992 and 2000. Collisions occurring in 2001 and the first half of 2002 were deemed unlikely to influence the existence of traffic calming by mid 2002. The Act of Parliament giving local councils the remit for traffic calming was passed in 1993 but will have taken a year or so before implementation.¹³

No ethics approval was sought for this study as it did not involve human participants.

RESULTS

The two local councils being studied comprised of 70 electoral divisions, 15 (21%) of which were represented by cabinet councillors at some point between 1995 and 2002.

Table 2 Spearman Rank correlation coefficients and p values between the incidence density of casualties and traffic calming density (n=70)

Period	Group	Correlation coefficient	p Value
1992–94	Pedestrians, all roads	0.57	<0.001
	Pedestrian, minor roads	0.59	<0.001
1995–97	Pedestrians, all roads	0.54	<0.001
	Pedestrian, minor roads	0.53	<0.001
1998–00	Pedestrians, all roads	0.51	<0.001
	Pedestrian, minor roads	0.54	<0.001

Table 3 Ratio of traffic calming features in represented wards relative to unrepresented ones, adjusting for measures of casualty, collision density, and by road type

Adjustment for total TCF per:	Ratio	Lower limit	Upper limit	p Value
Casualty 1992-94	2.06	1.32	3.22	0.0018
Casualty 1995-97	2.17	1.39	3.37	0.0009
Casualty 1998-2000	2.27	1.43	3.61	0.0008
Casualty 1992-2000	2.16	1.39	3.38	0.0010
Pedestrian casualty 1992-94	2.56	1.29	5.10	0.0082
Pedestrian casualty 1995-97	3.01	1.51	5.97	0.0021
Pedestrian casualty 1998-2000	2.93	1.43	6.02	0.0040
Pedestrian casualty 1992-2000	2.76	1.37	5.57	0.0053
Collision 1992-94	2.16	1.34	3.48	0.0020
Collision 1995-97	2.35	1.47	3.77	0.0006
Collision 1998-2000	2.45	1.48	4.06	0.0008
Collision 1992-2000	2.31	1.43	3.74	0.0009
Pedestrian collision 1992-94	2.59	1.29	5.17	0.0080
Pedestrian collision 1995-97	3.03	1.53	6.03	0.0020
Pedestrian collision 1998-2000	2.88	1.39	5.95	0.0050
Pedestrian collision 1992-2000	2.77	1.37	5.61	0.0054
Minor road casualty 1992-94	2.02	1.21	3.38	0.0081
Minor road casualty 1995-97	2.26	1.36	3.76	0.0021
Minor road casualty 1998-2000	2.35	1.37	4.02	0.0024
Minor road casualty 1992-2000	2.21	1.32	3.69	0.0029
Minor road pedestrian casualty 1992-94	2.52	1.17	5.42	0.0188
Minor road pedestrian casualty 1995-97	3.37	1.62	7.02	0.0016
Minor road pedestrian casualty 1998-2000	3.35	1.55	7.25	0.0026
Minor road pedestrian casualty 1992-2000	2.95	1.37	6.35	0.0064
Minor road collision 1992-94	2.12	1.23	3.68	0.0080
Minor road collision 1995-97	2.51	1.47	4.28	0.0010
Minor road collision 1998-2000	2.52	1.41	4.50	0.0023
Minor road collision 1992-2000	2.38	1.38	4.10	0.0022
Minor road pedestrian accident 1992-94	2.57	1.19	5.55	0.0168
Minor road pedestrian accident 1995-97	3.38	1.62	7.05	0.0015
Minor road pedestrian accident 1998-2000	3.26	1.50	7.08	0.0034
Minor road pedestrian accident 1992-2000	2.97	1.38	6.41	0.0063

There were a total of 1444 traffic calming features in the two council areas, 41.8% of which were in the cabinet represented areas, where the density of traffic calming was 1.5 features per km, compared with just 0.8 km in other areas (table 1). On minor roads, 42.6% of features were in cabinet represented areas.

Injury rates per km of road tended to be slightly higher in cabinet represented than non-represented areas for all injury groups in the earlier time period. The correlation between casualty incident rates per kilometre in the three periods and traffic calming density for all the minor roads across the 70 areas is shown in table 2. The results show a similar and moderately strong correlation between historical casualty incidence density with different periods and traffic calming density in 2002.

Analysis of traffic calming density and cabinet representation status showed that the density of traffic calming was consistently and significantly higher in cabinet represented, compared with non-cabinet represented, wards after adjustment for all injury groups (table 3). Looking at the first line of the table, in represented wards the number of TCFs installed per casualty per year recorded during the period 1992-94 is 2.06 times as high as in unrepresented ones. There is a small amount of variability in the ratios by time period with a tendency for higher ratios in the 1995-2000 era.

DISCUSSION

This study demonstrates that the distribution of traffic calming electoral divisions of two UK cities is associated with both the historical pattern of injurious crashes and with representation by an influential councillor. That traffic calming is sited in response to the pattern of injurious collisions is unsurprising. However, the finding that some politicians seem to be able to "lobby" more effectively on behalf of their constituents and strongly influence the

provision of safety features is a finding which has important public health implications. Before accepting the results of this study at face value it is worth exploring its limitations.

The longitudinal ecological approach used in this study demonstrates associations between the prevalence of traffic calming in 2002 and cabinet representation at any point since 1995, having adjusted for the number of injurious crashes over broad periods of time. A more robust approach, linking installation dates to the actual period of influence of any given politician, was not feasible because neither city holds easily accessible records detailing the installation date of the 1444 features, many of which will have been planned a considerable time in advance. Although installation dates were not available for each feature, conversations with engineers in both cities suggested that most features were installed from the mid 1990s onwards, following the Traffic Calming Act of 1993, which made the installation of traffic calming the remit of local authorities.¹³ There is always a delay between the enactment and implementation of legislation and this led to the choice of 1995 as the point from which to begin analysing the potential influences of councillors. The lack of exact installation dates also makes it difficult to associate specific council terms of office with the installation of features in any given area. There will be a time lag between election of a councillor, advocacy for local safety initiatives, and action being taken to install traffic calming. This study cannot distinguish between the effectiveness of lobbying by local politicians before and after they became members of a cabinet structure. Our hypothesis is that those politicians who subsequently became members of the cabinet structure were, on average, more influential than those who did not. Further research is needed to determine whether most of this influence occurs after appointment to the cabinet. Both councils had majorities from the same party over the period of the study.

Traffic calming is not suitable for all road types and suitability is dependant on a variety of factors. It is, of course, theoretically possible that roads in cabinet represented areas are more appropriate for the installation of traffic calming, leading to an increased density of features relative to non-cabinet areas, but this does not seem a plausible explanation. Analysis limited to minor roads which are more suitable for calming did not alter the findings.

Table 2 shows that across all areas the density of traffic calming was positively correlated with the incidence density of pedestrian casualties. Cabinet represented areas did have slightly higher injury rates in the 1992–94 period but the absolute and relative difference with non-cabinet areas fell over the next two three-year periods. The higher initial rates in the cabinet areas indicates that more traffic calming was required in these areas. However, having adjusted for differences in baseline rates, cabinet represented areas still had 2–3 times the density of traffic calming.

One obvious unmeasured potential confounder is the influence of lobbying for traffic calming by community groups. We do not have any quantitative data on this issue but the authors have lived in both cities during the timeframe of this study and feel that this is unlikely to be an alternative explanation. Lobbying for traffic calming by individuals and community groups is a frequent event, but usually follows a very serious or fatal accident at a particular site. It is difficult to know how effective such lobbying is but even if effective the intervention will likely be site specific. Our analysis is based on electoral wards which have around 28 injurious collisions per annum. Community lobbying would have to be both effective and several times more common in areas, which happen to be cabinet represented but have similar collision histories to other areas, before it could confound the results presented in this paper.

We cannot envisage any other factor which could confound the findings. We conclude that the results of this study support our hypothesis that cabinet status could be used as a marker of past or present influence and that this would be demonstrated by higher levels of traffic calming in the areas they represent.

Implications for prevention

That politicians advocate more effectively for those people that they represent, and who have, after all, elected them for that purpose may not be a surprise. However, the impact of their influence may surprise some. It would be useful to carry out similar studies in other areas to see to what extent the findings are generalizable, although it would be unusual if these human behavioral traits were not universal. We have not been able to find any studies with which to compare our results. The findings have several implications for prevention. First, injury prevention advocates and practitioners should recognize the potential importance of political influences on the provision and distribution of safety measures and carry out audits to determine whether local provision is distributed in an equitable manner. Second, these results indicate that lobbying councillors might be an effective means of increasing pedestrian safety and research into the effectiveness of this approach is required to test this hypothesis. Third, because pedestrian deaths and injuries produce one of the largest of all inequalities in health, advocating for improved safety in deprived areas could be a worthwhile intervention.^{17–19} Following this work the Department of Health in London has funded a multicentered research study (<http://www.miskin-group.org.uk>) to test the power of pedestrian safety advocacy with elected councillors in a cluster randomized trial across England and Wales.

Key points

- Reducing pedestrian injuries and particularly those occurring in deprived areas is a key component of government road safety strategies.
- The influence of local politicians on the total amount and distribution of pedestrian safety measures does not appear to have received much attention.
- In this study, historical pedestrian injury rates were similar in areas represented by local politicians who were members of the cabinet structure to those in non-represented areas, but cabinet represented areas had substantially greater amounts of traffic calming.
- Some local politicians seem to be able to increase pedestrian safety facilities in their areas.
- The effectiveness of engaging local politicians to support pedestrian safety through a process of targeted advocacy is being tested in a multicentered randomized controlled trial.

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REFERENCES

- 1 WHO. *World report on road traffic injury prevention*. Geneva: World Health Organization, 2004.
- 2 Peden MM, McGee K, Krug E. Injury: a leading cause of the global burden of disease, 2000. Geneva: World Health Organization, 2002. Available at <http://whqlibdoc.who.int/publications/2002/9241562323.pdf> (accessed May 2005).
- 3 Road Casualties in Great Britain 2004: Annual Report. Available at http://www.dft.gov.uk/stellent/groups/dft_control/documents/contentservertemplate/dft_index.hcst?n=14438&l=3 (accessed May 2006).
- 4 Christie N, Cairns S, Ward H, et al. Children's traffic safety: International lessons for the UK. Road Safety Research report No 50. London: Department for Transport, 2004.
- 5 Choosing Health: Making healthier choices easier. London: Department of Health 2004.
- 6 The Future of Transport. White paper, Chapter 6: walking and cycling. Department of Transport. Available at http://www.dft.gov.uk/stellent/groups/dft_about/documents/page/dft_about_031275.hcsp (accessed May 2005).
- 7 Hillman M, Adams J, Whitelegg J. *One False Move: A study of children's independent mobility*. London: Policy Studies Institute, 1991.
- 8 Haddon W. Energy damage and the 10 countermeasure strategies. *Inj Prev* 1973;5:331–5.
- 9 Mountain LJ, Hirst WM, Maher MJ. Are speed enforcement cameras more effective than other speed management measures? The impact of speed management schemes on 30 mph roads. *Accid Anal Prev* 2005;37:742–54.
- 10 Jones SJ, Lyons RA, John A, et al. Traffic calming policy can reduce inequalities in child pedestrian injuries: database study. *Inj Prev* 2005;11:152–6.
- 11 Towner E, Dowswell T, Errington G, et al. *Injuries in children aged 0–14 years and inequalities*. London: Health Development Agency, 2005.
- 12 Traffic Calming Act. London: HMSO 1993.
- 13 Local Government Act. London: HMSO 2000.
- 14 Ordnance Survey, Meridian. Available at <http://www.ordnancesurvey.co.uk/oswebsite/products/meridian2/> (accessed May 2006).
- 15 UK Data Archive. Available at <http://www.data-archive.ac.uk/> (accessed March 2004).
- 16 Royal Society for the Prevention of Accidents (RoSPA). *Road Safety Engineering Manual*. London: RoSPA, 2002.
- 17 Roberts I. Cause specific social class mortality differentials for child injury and poisoning in England and Wales. *J Epidemiol Community Health* 1997;51:334–5.
- 18 Christie N. Social, economic and environmental factors in child pedestrian accidents: a research review. Project report 116. Crowthorne: Transport Research Laboratory, 1995.
- 19 Lyons RA, Jones SJ, Deacon T, et al. Socio-economic variations in injury in children and older people: population based study. *Inj Prev* 2003;9:33–7.