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Through the Looking Glass: Tax Payer's Alliance and their campaign against speed cameras

On June 24, 2010, the Department for Transport announced the road casualty statistics for 2009. Road deaths had fallen to 2,222, 12% down on the year before. This was the lowest number of road deaths ever recorded and contributed to another milestone in road safety – meeting the ten year target of reducing those killed and seriously injured in road crashes by 40%. In fact it had been met and surpassed a year early with 44% fewer deaths and serious injuries in 2009, compared to the baseline period (1994-98).

Despite these achievements, a fortnight later, the right-wing pressure groups, the Tax Payers' Alliance (TPA) and the Drivers' Alliance produced a report attacking the amount of money raised from speeding fines and asserting that speed cameras had been ineffectiveⁱ. Their analysis of the impact of speed cameras was critically flawed and unoriginal but it included Tables giving the fines levied in each local area. The story has since been picked up uncritically by a raft of local newspapers and websitesⁱⁱ, mostly seeking to encourage outrage at the amount of money raised locally by "ineffective" speed cameras. It is critical that their misinformed views are robustly challenged.

RoadPeace responded rapidly to the TPA report in a press releaseⁱⁱⁱ. In the light of the media attention the TPA report has received, a more detailed analysis is presented here of the report itself and of the TPA's response to the criticisms of RoadPeace, that has since appeared on their website^{iv}.

The key criticisms of the TPA are:

1. They are evidence deniers. They disregard the site specific studies that have demonstrated the effectiveness of safety cameras.
2. They attribute all changes in the national casualty rate over the last three decades to the presence or absence of speed cameras. With so many other factors at play, this makes as much sense as measuring the effectiveness of a cancer strategy by changes in overall NHS mortality rates.
3. Their choice of statistical method is inappropriate and biases the analysis towards the result they are seeking: they use a linear method and assume that casualties should continue dropping by the same number although the base figure keeps getting smaller, thus representing an increase in the rate of reduction.
4. Their choice of periods is also biased. The first and last years of the analysis are chosen to suit their conclusions, as is their division of the before and after speed camera periods.

Camera effectiveness: the evidence

There have been more national evaluations of safety cameras than any other road safety intervention. A two year pilot programme was stopped early because it was proving so effective. The Department for Transport stopped collating the evidence for safety cameras after conducting four national evaluations of safety cameras.

The fourth national camera evaluation, published in December 2005, concluded that where cameras were introduced, they resulted in

- Decrease in personal injury collisions by 22%
- 42% fewer people killed or seriously injured
- Reduction of 100 fatalities per annum (32% decrease)
- 1,745 fewer people killed or seriously injured and 4,230 fewer personal injury collisions per annum in 2004.
- Reduced speeding by 70% at new fixed camera sites and by 18% drop at new mobile camera sites.
- Overall, the proportion of vehicles speeding excessively (i.e. 15mph more than the speed limit) fell by 91% at fixed camera sites, and 36% at mobile camera sites.
- A positive cost-benefit of around 2.7:1, with the benefits to society from the avoided injuries in excess of £258 million compared to enforcement costs of around £96million.

Regression to mean factor

The effectiveness of safety interventions, including speed cameras, in reducing collisions, casualties and deaths are generally evaluated by using before and after casualty statistics at the sites where they are introduced. Where interventions are a response to high casualty rates, this approach can overestimate their benefits, due to a statistical problem known as “regression to mean” (RTM).

The fourth year camera evaluation included a study of the effect of RTM. However, there were only 216 camera sites that qualified for the RTM study. The average annual effects of the cameras was estimated to be a saving of 0.75 personal injury collisions (PICs) per site with RTM and trend accounting for additional annual reductions of 0.31 and 0.37 PICs respectively^v.

The TPA take a different approach (which they justified in their response to RoadPeace by hiding behind the regression to mean problem). They calculate the road casualty rate per billion passenger km over the period 1979-2007. This displays an overall downward trend, see Actual casualty rate in Figure 1 below. They then divide the period into two: 1979-1990, before the introduction of speed cameras, and 1991-2007, after the introduction. They then project how many casualties would have occurred if the 1979-90 trend had continued after 1991.

Some of the press has accepted this analysis without reflection but their approach and implications they infer for road safety are seriously flawed.

No single measure responsible for national situation

The TPA give no reason why any change in the national casualty rate should be simply attributed to the presence or absence of speed cameras, when so many other factors are also at play: changes in roads (geometry, surfaces), vehicles (brakes, air bags, seatbelts), driver characteristics (attitudes, demographic profile of driving population etc.), not to mention the numerous legal and policy interventions designed to influence both drivers and their environment. These often occur over time, as vehicles are replaced, infrastructure upgraded or laws ever more widely understood and applied. The long term decline in the casualty rate must be seen as the cumulative effect of all of these.

How much might speed cameras be expected to contribute? Speed cameras can cut the number of drivers speeding by 70% and deaths at sites by 18-24% but they are only active on less than 1% of UK's road network.

Their relative significance to the overall road safety picture can be judged from a 2000 report of the Transport Research Laboratory^{vi} which suggested that "measures for speed reduction" (of which speed cameras were a leading but not the only component) were expected to contribute only about a fifth of the anticipated reduction in the decade to 2010. As TPA only consider national casualty figures, the impact of speed cameras would inevitably be lost in the noise from other factors.

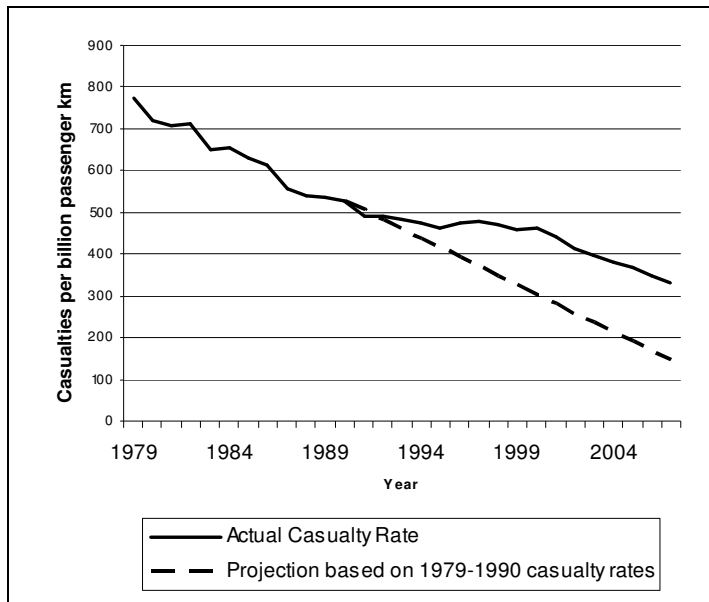


Figure 1 Actual casualty rate and rate predicted by TPA

The TPA approach therefore makes no more sense than assessing the effectiveness of a new cancer strategy by looking at trends in fatalities over the whole NHS.

Wrong statistical method

TPAs' choice of both the statistical methods used and the periods compared in their analysis are given no justification but consistently produce a more negative picture of the effects of speed cameras than more/equally justifiable approaches.

First, the model used by the TPA is inappropriate. In their analysis, they assume that, based on the 1979-90 trend, each year there will be a reduction of 22,553 casualties per billion passenger km. Following their logic, this would have seen casualty rates fall to zero by 2013, had there been no speed cameras. The problem is their method. As the national casualty rate declines, the harder it becomes to decrease it by a fixed amount. In comparing periods, their concern should have not have been the year by year absolute decline in the casualty rate but the proportionate or percentage decline.

Wrong before-after time periods

TPA's choice of the periods for comparison is also contentious. Their use of 1979 as the first year of their reference period is given no justification. As can be seen from the Figure below, the immediate period prior to 1979 showed very low rates of decline.

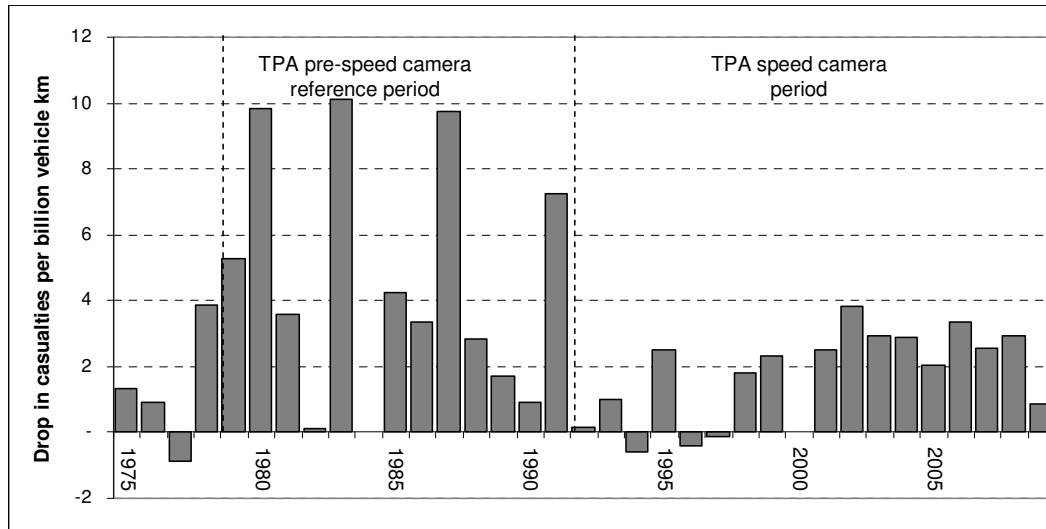


Figure 2 Year on year change in casualties per billion vehicle km, 1960-2008

It is also biased in the division of the period of study. Of the 5,562 camera sites^{vii} available in March 2007, only 13% had been established by 1996 and 35% by 2000. Speed cameras (speed and red light—TPA hates both) became more widespread after 2001 when hypothecation was introduced and those providing the cameras could retain the fines. But, as can be seen above, it was in the earlier period (1991-2000), with fewer cameras, that the rate of decline in road casualties slowed. In the period after 2001, the rate of decline was consistent, similar to that in the 1980s in average numerical terms and higher as a percentage.

In their response to RoadPeace on this point, TPA argue that though speed cameras were not widespread during the 1990s, the government's policy shift to "*focussing overwhelming on enforcing speed limits*" started with their advertising campaigns, including "Kill your speed not a child" and "Speed kills". The TPA seem to have confused encouraging compliance through publicity campaigns with enforcing speed limits which did not happen until after hypothecation, with the number of speeding fines nearly tripling between 2001 and 2004.

Conclusions

In their report on speed cameras the Tax Payers Alliance seem to have forgotten who they are supposed to be: speeding fines come from those who break the law; any money raised over and above the cost of collection, will reduce the amount paid by ordinary taxpayers. Law-breakers Alliance would be a better term. But it their concern to discredit speed cameras which is the principal concern for RoadPeace.

Speed cameras are an important tool in reducing speeding and the casualties this brings. Their effectiveness has been proven at the sites where they operate, even when allowance is made for the statistical problem of regression to mean. The TPA analysis based on changes in trends in national road casualty rates is, despite its scientific pretensions, fundamentally flawed:

- The attempt to explain all changes in the national rate of casualties per billion vehicle km in terms of a single variable is misguided. This rate varies significantly between years and over longer periods in response to all the factors that influence the road, drivers and their vehicles. The effect of any single factor -- speed camera or any other -- would be lost in the noise.
- they estimate the wrong variable (numerical decline in the casualty rate, rather than the proportional decline), exaggerating the difference between the periods before and after speed cameras; and they choose the period for analysis that seems engineered to favour the conclusions that they reach.
- but, even then, their analysis does not work, as the decline in casualty rates stalled only in the period before speed cameras were widely installed. Their claim **that it is the policy/advertising campaign to reduce speed that is causing the problem**, not the speed cameras and speeding fines themselves, comes straight out of Alice in Wonderland.

ENDNOTES

ⁱ Tax Payers' Alliance and Drivers' Alliance, Report No.3 Speeding fines. <http://www.taxpayersalliance.com/speedcameras.pdf>

ⁱⁱ The following is a selection:

Daily Echo, 9 July 2010 "Poole speed camera set to make more money than ALL other Dorset cameras combined" <http://tiny.cc/i2uzr>

Express & Star, 9 July 2010, "Speed camera fines more than £15m" <http://tiny.cc/jukkj>

This is Leicestershire, 9 July 2010 "Leicestershire drivers pay out a total of £1m in fines". <http://tiny.cc/t0f7r>

Rochdale Online, 9 July 2010 "Motorists pay £2.9m in speed camera fines" <http://tiny.cc/avjl6>

The Scottish Sun, 9 July 2010, "Flash, bang.. walloped", <http://tiny.cc/uwmzf>

Norwich Evening News 12 July 2010 "Money raised from Norfolk's speed cameras revealed" <http://tiny.cc/kyr5b>

This is Scunthorpe, 13 July 2010 "VOTE: Taxpayers' and Drivers' Alliances call for scrapping of speed cameras" <http://tiny.cc/udkpw>

News&Star 14 July 2010 "£2 million in fines levied against drivers in Cumbria" <http://tiny.cc/nli3n>

This is Staffordshire, 14 July 2010 "Cameras on roads net £7m in fines", <http://tiny.cc/hxvn3>

Lancashire Evening Post, 14 July 2010 "Lancashire drivers losing out to Gatsos" <http://tiny.cc/jqt3t>

Herald Scotland, 14 July 2010, "Speed camera system costs taxpayers £3m" <http://tiny.cc/bfdl6>

ⁱⁱⁱ http://www.roadpeace.org/resources/PR_090710_TPA_response.pdf

^{iv} <http://www.taxpayersalliance.com/research/2010/07/tpa-response-to-roadpeace.html>

^v Stephane Hess (2004) "An analysis of the effects of speed limit enforcement cameras with differentiation by road type and catchment area". http://www.stephanehess.me.uk/files/Hess_2004.pdf. Gains, A., Nordstrom, M., Heydecker, B., Shrewsbury, J. (2005) The national speed camera programme:

Four-year evaluation report. PA Consulting Group and Centre for Transport Studies, London, Appendix H. <http://tiny.cc/33npt>

^{vi} TRL (2000) The numerical context for setting national casualty reduction targets. TRL Report 382. ISBN1-84608-381-8

^{vii} As distinct from road cameras, which are generally installed in only a small fraction of the available sites.

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Notes to Editors: Founded on the road danger reduction principle which seeks to achieve a more sustainable, civilised and healthy environment, RoadPeace believes the duty of care lies with motor vehicle owners and drivers and more needs to be done to reduce the danger they pose, especially to children, older people, pedestrians and cyclists.