Outcomes of an intensive traffic enforcement operation in New Zealand.

Abstract (limit: 150 words)

In the past decade, New Zealand has faced a high level of traffic mortality, ranging 7 to 8 fatalities per billion vehicle kilometres travelled (B VKT). This brought increasing pressure on Police to increase its intensity of enforcement for breath testing and speeding. A national operation (2023-present) was devised to maximise general deterrence for risky driving offences, combining dosage, unpredictability, and rural deployment. Breath tests increased from 2.1 million in 2022 to 4.1 million in 2024. Officer-issued speed notices increased from 326,000 in 2022 to 461,000 in 2024. Early indications to indicate a negative relationship between the amount of traffic enforcement and the rate of traffic fatalities. In 2024, New Zealand recorded a historic low rate of road deaths of 5.9 per B VKT. Traffic enforcement is an effective road safety measure at high intensity; however, it is no panacea.

Social media post (limit: 280 characters)

New Zealand Police has undertaken a large-scale national traffic enforcement operation over the past two years. The intensity of traffic enforcement activity was likely among the highest per head of population worldwide. In 2024 New Zealand had a historic low rate of road deaths. We further explore the relationship between road policing and traffic fatalities, as well as its constraints as a road safety measure.

Background

Since a previous historic low traffic fatality rate of 6.2 deaths per billion vehicle kilometres travelled (VKT) in 2013, New Zealand has faced an increased level of traffic-related mortality, ranging between circa 7 and 8 road deaths per billion VKT. With little progress made in improving road safety performance over the ensuing decade, this has placed New Zealand in the top quintile in terms of road deaths per distance travelled and per head of population (OECD/ITF, 2023).

This ongoing lack of progress in improving New Zealand's road safety performance brought with it scrutiny on the New Zealand Police and wider road safety sector. In particular, the levels of alcohol breath testing and speed enforcement were viewed as insufficient. In response to this and the aforementioned ongoing challenge, New Zealand Police sought to leverage the general deterrence effect and maximise its impact to improve road safety.

Previous research has provided evidence of a dose-response type relationship between enforcement and safety – that is, increases in the intensity of enforcement is associated with a reduction in traffic fatalities (Elvik, 2001, p. 35).

Conference theme: Evolution

The current paper presents the results of a prolonged intensive traffic enforcement operation in New Zealand and proposes further evidence of the relationship between the relative amount of enforcement and the corresponding rate of traffic fatalities. It describes both a contemporary evolution of one functional aspect of a safe system (traffic enforcement) and how traffic fatalities vary as a factor of enforcement intensity over past decades. While increases in traffic enforcement can be shown to be effective in reducing traffic casualties over time, there are constraints to relying on intensifying traffic enforcement activities to improve road safety performance.

Approach

Commencing 19 December 2022 (to present), New Zealand Police introduced "Operation Open Roads". This is a national operation that has aimed to increase proactive traffic enforcement by setting challenging targets. This has included: speed limit exceedance including an increase in the rate of deployment to rural roads and notices issued to low level speeding <11 km/h excess; random breath testing for alcohol (including an increased rate of tests undertaken during 'high alcohol hours' (chiefly Friday 22:00-Saturday 02:00, Saturday 22:00-Sunday 02:00); seat belt non-compliance; and hand-held mobile phone use. The operation has presently been in place for over two consecutive years with support from Police leadership and operational police officers.

Results

Operation "Open Roads"

Police districts were provided with a bespoke dashboard which contained recent road policing activity and progress toward its annual targets. These targets involve several enforcement goals (officer issued offence notices or charges).

Under the operation, breath tests increased from 2.1 million in 2022 to 3.2 million in 2023, and to 4.1 million in 2024. Officer detected speed notices increased from 326k in 2022 to 403k in 2023 and 461k in 2024.

Traffic fatalities

The number of road deaths have declined for two consecutive years over 2023 (342 deaths) and 2024 (292 deaths). After COVID-19 related travel restrictions ended in 2022 (371 deaths), the number of road deaths rose sharply and reverted to a similar level seen in 2018-2019 (372 in 2022 vs 378 in 2018 and 2019). During the COVID-19 related travel restrictions, New Zealand experienced a reduced level of road deaths of 318 in 2020 and 319 in 2021, consistent with international anomalous reductions (OECD/ITF, 2022).

Per total distance travelled (B VKT), 2024 also had the lowest number of road deaths in any year in recent history at 5.9 per billion VKT, for reference this rate was 7.7 in 2022 (-23%).

The relationship between traffic enforcement intensity and road safety performance

There is evidence of a previously documented relationship between the amount of traffic enforcement and a corresponding rate of traffic casualties. Elvik described the relationship between enforcement intensity for alcohol testing, manual speed enforcement, seat belt enforcement, and total traffic enforcement in Norway (Elvik, 2024; 2012). New Zealand data was structured in a similar manner to what is described in Elvik (2024) to assess whether the relationship between traffic enforcement intensity and the rate of traffic fatalities could be replicated.

New Zealand data was analysed in the same manner described in Elvik (2024), with data available for 1998 – 2024. Total traffic enforcement was divided by annual total VKT and the proportional change from the indexed year (being the year with the least amount of enforcement per million VKT) against the proportional change in road deaths in the corresponding year.

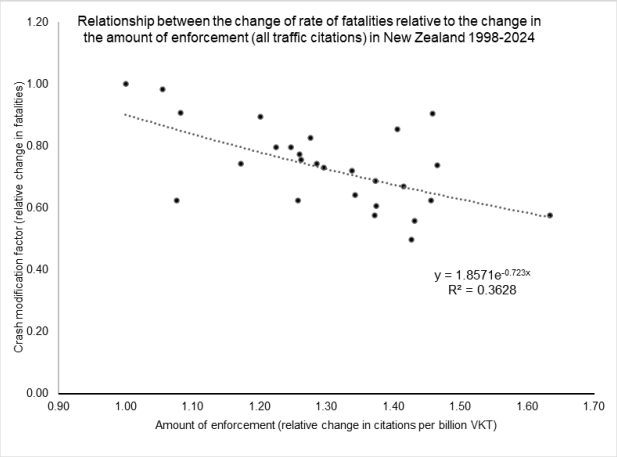

Figure 1. Total traffic offences (notices and charges) per million vehicle kilometres travelled (indexed to lowest year) vs change in road deaths in corresponding year (1998 - 2024).

The results largely replicated the findings presented in Elvik (2024) with some variation. Years with a higher rate of offence detection tended to have a lower rate of traffic fatalities.

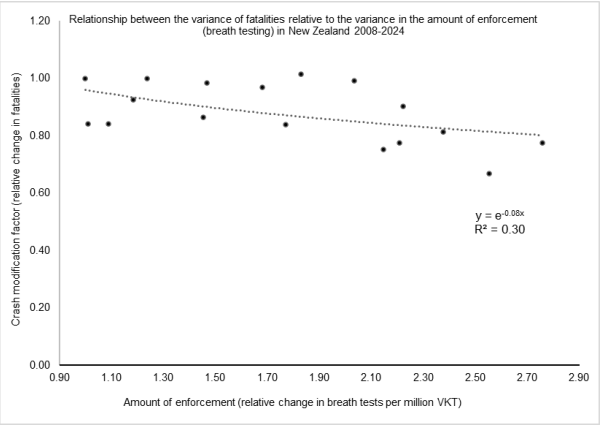

Figure 2. Random breath tests undertaken per million vehicle kilometres travelled (indexed to lowest year) vs change in road deaths in corresponding year (1998 - 2024).

The enforcement data considered in Figure 1 does not include the variation in breath alcohol test intensity. This data was separately modelled and produced a similar result (Figure 2). Higher amounts of breath testing tended to be accompanied by a lower rate of traffic fatalities. Overall, the results appear congruent with the studies reviewed in Elvik (2024).

It was considered to include serious injuries in these analyses, however, while a similar relationship was produced, this substantially reduced model fit. It appears that the relationship between increased traffic enforcement intensity, in this case mostly breath alcohol tests and speed enforcement, is more strongly related to reducing the most severe (fatal) traffic injuries. This finding is consistent with previous studies (Elvik, 2024; Elvik et al., 2019). The relationship between increased speed and the incidence of fatal vs non-fatal injuries being much steeper for fatal injuries (Cameron & Elvik, 2010). Elvik (2024) also noted "A given change in the amount of enforcement is associated with a larger change in fatal injuries than in less serious injuries" (p. 8.). Traffic offending appears to be related to the most severe of traffic crashes.

Benefits to road safety

Further developments of the work on the traffic safety effect of traffic enforcement intensity (Elvik, 2001) are described in Elvik and Elvik et al. (2011; 2012). Carson et al. (2022) have additionally provided some key traffic enforcement statistics in European jurisdictions per 1,000 population, including for manual/automated speed enforcement, breath alcohol tests, seat belt offences, and mobile phone offences. Using the estimates described in Elvik et al. (2012) combined with the traffic enforcement statistics provided in Carson (2022), it is possible to calculate the estimated crash modification factor of the level of traffic enforcement intensity and how this compares on a population moderated rate for New Zealand (2024) with Norway (2018) as a reference. Table 2 contains the results of these estimates.

Table 2. Estimated effect of increased level of traffic enforcement in New Zealand.

Type of enforcement	Traffic enforcement		Per 1,000 population		Increase (times)	Fatal crash modification factor (%)
	NZ (2024)	Norway (2018)	NZ (2024)	Norway (2018)		
Speeding	460,858	102,629	86	19	4.5	9.9
Breath tests	4,060,958	937,325	761	177	4.3	7.2
Seat belts	48,996	4,236	9	1	11.5	6.7
mobile phone	59,141	20,123	11	5.0	2.9	n/a

Implications for policy and/or practice

As per the estimates of the crash modification factors of enforcement in intensity described in Elvik et al. (2012), the level of traffic enforcement intensity in New Zealand under 'Operation Open Roads' is near to the level where benefits begin to outweigh costs. The relationship detailed in Elvik et al. between traffic enforcement and effects on the rate of fatalities is not linear, but logarithmic, as was also the case in the data analysed in the present paper.

By cross referencing the work by Elvik et al. (2012) with the data presented in the current paper, it can be inferred that there are likely limits to what improvements in road safety performance can be derived from further increases in traffic enforcement intensity. Comparing the rate of traffic enforcement per 1,000 population (Carson et al., 2022), the intensity of traffic enforcement in New Zealand in 2024 was substantially higher compared to many European jurisdictions – jurisdictions with much higher road safety performance (OECD/ITF, 2023). The points of difference between road safety performance in New Zealand compared to well performing jurisdictions are likely varied and reach across the implementation of many parts of the safe system.

Conclusions

While the results of the current study support the notion that higher intensity traffic enforcement is associated with a lower rate of fatal traffic injuries, and the enforcement operation was accompanied by the lowest rate of traffic fatalities in recent history, the findings are also cautionary. The Traffic enforcement operation was largely successful in lifting traffic enforcement intensity within a relatively short period of time. However, even with four or more times the level of enforcement reported by Norway, New Zealand's record of road safety performance is yet to advance (OECD/ITF, 2023). In 2024, New Zealand experienced 5.5 road deaths per 100,000 population, while an improvement on 7.3 deaths per 100k in 2022, Norway recorded just 1.7 deaths per 100k in 2024. The results obtained from this large-scale traffic enforcement operation demonstrates why it is important to adopt and implement an approach that strengthens all parts of the system to substantially advance traffic injury prevention. NZ Police intends to continue this national road policing operation into 2025 and monitor its effects more locally.

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