



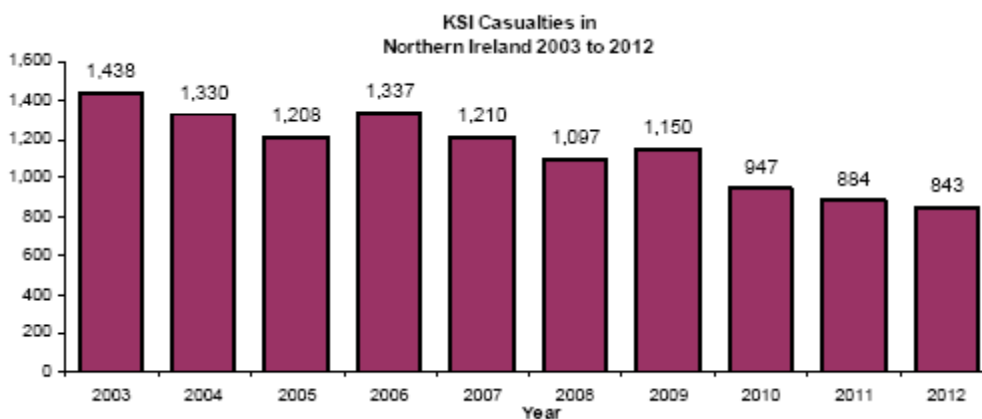
Knowledge Exchange Seminar Series (KESS)

Driving as a Public Health Problem.

Dr Nicola Christie (UCL), Dr Philip Edwards (LSHTM), Professor Judith Green (LSHTM), Dr Sarah Jones (Cardiff University), and Professor Lindsay Prior (QUB).

1. The Issues:

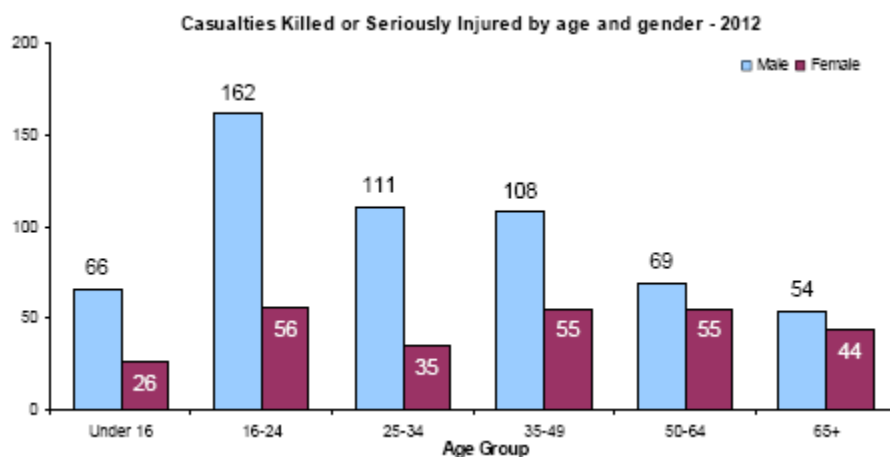
Although the number of deaths and injuries from road traffic collisions in Northern Ireland (NI) has been falling year on year since the early 1970s, such collisions still result in a significant burden to the community in terms of lives needlessly lost and lives severely damaged. The PSNI 'Key Statistics' Report for 2013 summarized the most recent casualty pattern (where KSI= killed & seriously injured) thus;



(Source: PSNI, 2013:4)

Typically, well over 50% of the casualties are drivers (NISRA, 2013) and though vehicle drivers from across the entire age range are involved in collisions one group that is particularly prone to serious hazard is that of young drivers - especially males. Available data for 2008-10 indicate that young drivers (aged 17 to 19) in Great Britain (GB) were involved in 10.9% of all crashes, resulting in 77470 (13.9%) casualties and 11.4% (n=678) of fatalities (Jones et al, 2012). However, in NI during the same time period young drivers were involved in 17.5% of crashes resulting in 20.4% of casualties and 22.7% of fatalities. The 2012 pattern for NI (using a wider age range) is represented in the graph below. Note that across the UK 17-19 year olds hold fewer than 2% of full driving licences, consequently their involvement in crashes, casualties and fatalities is markedly disproportionate to their representation on the roads.

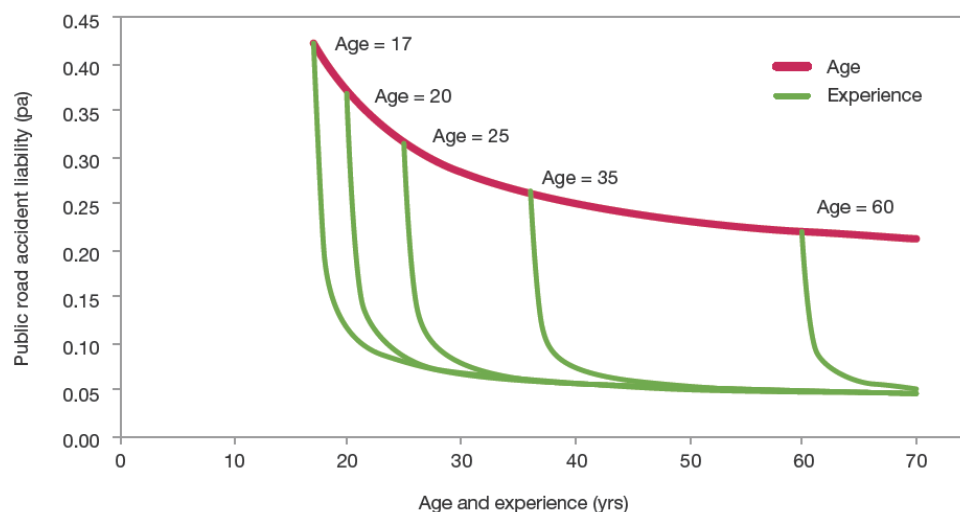
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(Source: Police Service of NI - PSNI (2013:9))

A key problem with young and novice drivers is lack of experience (OECD, 2006). Inexperience explains much of the high levels of young driver risk, and as demonstrated in the figure below, it has a greater effect on collision liability than age of licence-holding alone. However, the risk of crash involvement is far greater for newly qualified young drivers than for newly qualified older drivers. There are also known and identifiable risk factors for young people in addition to experience – these include night-time driving and carrying passengers of a similar age.

The effect of age (at passing test) and experience on collision involvement



Source: RAC Foundation (2013)

Inevitably, patterns of behavior exhibited by young drivers can have serious and long-lasting negative consequences for families, communities and the NHS; OECD (2006) estimate huge economic as well as social costs from bad driving. Many casualties suffer life changing injuries, requiring long term care or follow up. There is also a link between the socioeconomic circumstances of young drivers and their involvement in fatal crashes. Compared to drivers from the most affluent areas, those from the most deprived areas in GB are more likely to have been involved in a fatal crash involving reckless driving, impairment or where the driver does not have a licence, tax or insurance than their counterparts from the least deprived areas (Clarke et al, 2008; Ward et al, 2007)). The same is probably true of NI.

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2. Interventions and the role of GDL.

Reducing the rate of vehicle collisions involves many different kinds of approach – engineering, educational, law enforcement and driver training. The efficacy of such approaches is variable and some argue that training and educational interventions are ineffective in reducing casualties among the young. One form of intervention that seemingly has an impact on young drivers involves the introduction of a Graduated Driver Licensing (GDL) scheme. GDL schemes aim to reduce young driver crash rates by the adoption of various measures. Most such schemes involve a three-part process: an introductory period during which a novice driver is supervised by an experienced driver; an intermediate period during which the novice driver is restricted in what he or she is permitted to do; and a final period in which the novice emerges as a fully qualified and independent driver. It could be argued that Northern Ireland has operated a weak form of GDL over many decades - as evidenced by the use of 'R' plates and speed restrictions – however, a robust and effective approach would involve much more than 'R' plates and include such measures as restrictions on carrying teenage passengers, driving late at night, week-end driving and drinking alcohol (Russell et al, 2011).

The first, full GDL scheme was implemented in New Zealand in 1987. Since then, international uptake has been slow, but GDL schemes are now in place throughout Australia, the USA and Canada. A Cochrane review (Russell et al, 2011) could not make an overall estimate of effect of GDL because of wide differences in the types of schemes in operation (for example, some schemes involve night-time curfews whilst others do not). Nevertheless, the review concluded that reductions in crash rates were seen in all jurisdictions and for all crash types. Amongst all teenage drivers, injury crashes decreased by a median of 20% beyond the first year post GDL. However, the review also called for more robust evidence to understand the effects of such schemes, and to consider which of the specific intermediate restrictions was likely to have most impact.

That there is compelling evidence for GDL in reducing young driver crash rates was also the conclusion of a review carried out recently in the UK (Kinnear et al, 2013). This review was commissioned by the UK Department for Transport (DfT) and examined the evidence published since Russell et al (2011). The review highlighted the fact that there are a number of commonly cited barriers to the implementation of GDL, namely issues around enforcement and compliance and effects on mobility and employment (especially in remote areas; Kinnear et al, 2013). In 2008, DfT cited these concerns as their rationale for not considering GDL (DfT, 2008). Since then, however, there have been further calls across the UK for GDL to be implemented

As hinted above, there is a lack of understanding of the relative contribution of the key components of GDL to the reduction of casualty rates. To date, new young drivers in NI have been limited to 45 mph and have had to display an R plate. Planned changes (to be introduced to the assembly in 2014) are to reduce learner age from 17 to 16.5, introduce a minimum 1 year learner period, and restrict the carrying of passengers aged 14 to 20 for the first six months of the full licence for new young drivers. There is no suggestion of a night-time curfew. Given the limits in evidence to date, there is no 'gold standard' GDL model, but some elements have more robust evidence for effectiveness. These components cover both the learner and the post-licence or intermediate period. In the learner phase, a minimum learner period is one key component associated with effectiveness, whereas passenger restriction is a key element associated with the effectiveness of the intermediate phase. The proposed reduction of the licensing age from 17 to 16.5 in the Northern Ireland GDL scheme is an unprecedented move in global road safety which has not to date been studied. However, as with all GDL schemes, the proposed NI scheme incorporates a number of components, and it will be implemented in a complex transport system which may be changing in a number of significant ways. These include potential cultural shifts in young driver behaviour, including trends toward later licensing (Le Vine and Jones, 2012), reform of the public transport infrastructure following the NI Transport Act 2011, and technological change, such as in-car telematics used by insurance companies to regulate driver (particularly young driver) behaviour.

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3. Proposed Research.

A team led by Dr Nicola Christie (UCL), and including Dr Philip Edwards (LSHTM), Professor Judith Green (LSHTM), Dr Sarah Jones (Cardiff University), and Professor Lindsay Prior (QUB) have recently submitted a research proposal to the National Institute for Health Research to investigate the consequences of introducing a GDL scheme to Northern Ireland.

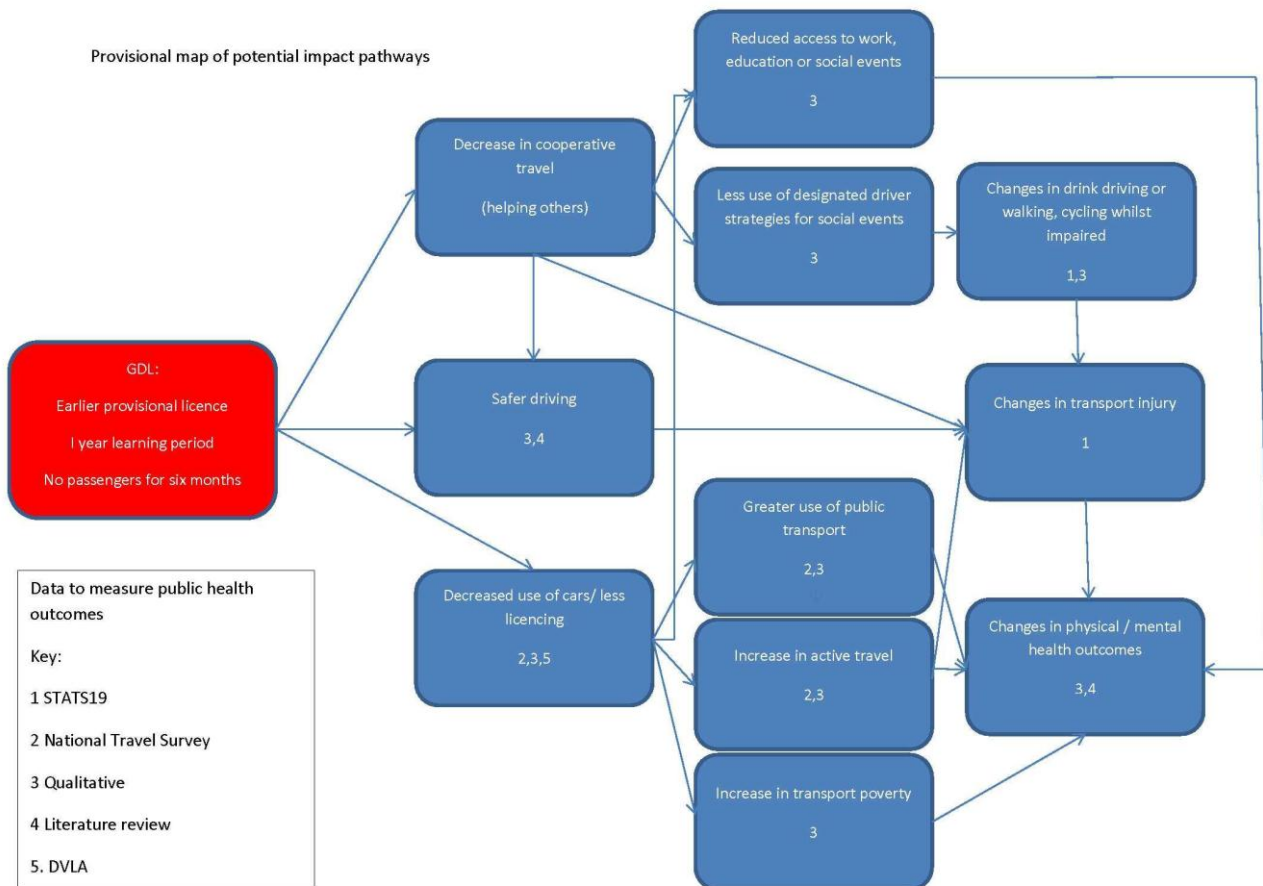
The primary aim of the research is to evaluate whether the proposed changes to driver training and testing significantly reduces crashes and casualties associated with young drivers. The primary outcome for this aim is number of crashes per licensed driver. Change will be evaluated using a controlled interrupted time series analysis of crashes per licensed driver. This can detect whether there are significant changes in temporally ordered outcomes, taking into account the secular trends and random fluctuations by comparing with a control area to assess whether these changes might have happened irrespective of the intervention. The primary outcome will be injury crash rates per licensed driver aged 16, 17, 18, 19, 20-24 and 25 to 59. Secondary outcomes will also be assessed using a controlled interrupted time series analysis, with a comparator age group (25 to 59 year olds in England) to evaluate the effect of the introduction of NI GDL on all car occupant casualties per head of population among young people aged 16 to 19, and to examine any changes in car occupant casualty rates per km travelled, using national travel data.

A second aim is to identify the full range of effects of this intervention on young adults and their parents, focusing on those effects which impact on wellbeing – broadly defined. We will use a comparative qualitative analysis of changes in NI with changes in England to identify both how the intervention has affected wellbeing outcomes, and also the extent to which different components of the intervention interact with other elements of the wider system (such as public transport provision or accessibility; changes in in-car technologies). Our objectives here are to explore the implications of the scheme for young people, their parents and broader social networks. Key topics of investigation concern access to work, education, religious, cultural or social activities. We also wish to inquire into how any changes associated with the scheme affect wellbeing, and to assess the acceptability of the scheme. Qualitative changes in impacts of GDL on wellbeing will be assessed in NI and compared to the experiences of young people in England where no such legislation exists. The secondary aim will be achieved by the use of suitable qualitative methods.

4. Assessing Impact

The figure on the next page indicates some of the possible pathways by which GDL will impact on the wellbeing of young people, and the data sources we propose to use to characterize and evaluate these impacts. The hypothesized pathways will be comprehensively mapped out in collaboration with our Study Steering Committee and Young Peoples Reference Group (between them these will include key stakeholders such as, young people, representatives from central government, local authority road safety and public health practitioners, road safety charities and the insurance industry) in the first meeting. This mapping exercise will also inform the development of the topic guide for focus groups and identify bodies of additional literature (particularly grey literature) to be included in reviews.

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5. Conclusion

- There are significant casualty risks associated with young drivers, as well as their passengers and other road users.
- The risks relate to a number of factors, but it is at least clear that lack of driving experience, night time driving and carrying passengers of a similar age are strongly associated with casualty patterns among the young.
- Attempting to reduce casualty rates via the provision of education and training programmes for young drivers appears to be popular with the public, but research suggests that that such interventions are mostly ineffective.
- Graduate driving licence (GDL) programmes on the other hand have been shown to be effective in reducing rates of fatality, injury and hospitalization among drivers and passengers.
- The imminent introduction of GDL legislation in Northern Ireland offers an excellent opportunity to investigate the efficacy of a GDL programme and to assess the different ways in which it will impact on the lives of young drivers and on the community as a whole.

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