

RSRR 123 Road User Safety and Disadvantage – Appendix 2: Literature Review

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1 Review of evidence

1.1 Background

Despite an overall decline in the number of road traffic related deaths and injuries in recent years, it remains the case that people from deprived areas remain at higher risk than those from more affluent areas. Although the evidence is not absolutely clear on the relationship between economic disadvantage and the risks of being involved in a road traffic accident, there is a general consensus that the 'socio-economic gradient' is real.

The relationship between injuries experienced by pedestrians, cyclists, bus passengers, car drivers, car passengers and motorcyclists, and of the type of casualties where differential risks occur, has been widely documented. In particular, the evidence highlights the injury inequalities between more and less deprived communities for children and young people when walking/cycling and of young people as car passengers. It also makes it clear that these relationships are not accounted for by the number or nature of the trips they undertake ('exposure'), but instead that the relationship is strongly influenced by factors associated with deprivation.

A number of studies have been undertaken to examine the nature of these relationships. However, the factors which influence this higher risk are poorly understood, meaning that developing an effective policy response is difficult. This appendix presents a brief review of the existing evidence on the known relationships and explanations for the heightened risks faced by different groups of people living in deprived areas. In so doing, it sets out some suggestions for next steps in terms of developing our understanding of the underlying factors which might explain these risks and on some of the types of intervention the evidence suggests may be effective in addressing them. It concludes by setting out the implications for road user safety and disadvantage research.

1.2 The policy context

Increasing public safety in disadvantaged areas is the aim of a number of national and local initiatives, some of which have specifically focused on road safety and others which have done so as part of a wider strategy. This section briefly discusses some key aspects of the policy context in which these initiatives are taking place as they apply to children and young people (although, obviously, some of this work also applies to other sections of the population).

In October 2007, the Government published its priority outcomes for the period 2008–11, this includes 30 Public Service Agreements (PSAs) which it will use to monitor progress (HM Treasury, 2007). A number of PSAs are specifically intended to improve children and young people's outcomes, in that they aim to address:

- poverty (PSA 9);
- improve health and well-being (PSA 12);
- improve children and young people's safety (PSA 13);
- increase the proportion of excluded adults in settled accommodation, education and training (PSAs 14 and 16);
- build more cohesive and active communities (PSA 21);
- make communities safer (PSA 23); and
- reduce the harm done by alcohol and drugs (PSA 25).

This range of PSAs underpins a number of cross-government strategies, such as **Opportunity for All** (OfA) (e.g. Department for Work and Pensions, 2007), which is focused

on tackling poverty and social exclusion, and **Every Child Matters** (ECM),¹ which aims to ensure that all children and young people have the support they need to be healthy, stay safe, enjoy and achieve, make a positive contribution and achieve economic well-being. Clearly, the reduction of disadvantage and the promotion of safety are likely to be complementary in improving the life chances of children and young people.

A core part of ECM is **Staying Safe**,² a comprehensive cross-government strategy which aims to put in place structures and processes to ensure that government action to improve safety over the period to 2011 will be co-ordinated and coherent, and that it will be delivered at a local level with clear support from central government departments. As part of this, and specifically on road safety, the Government committed that, between 2007–10, it would:

- implement the 2007 child road safety strategy – including the production of a full range of road safety materials for children by 2011, continuing publicity campaigns aimed at parents, children, teenagers and young drivers, and a dissemination programme to inform local authorities about the benefits of Kerbcraft;
- consult, in early 2008, on a new driver training and testing system to address the safety of drivers and passengers aged 16–18, including proposals for an overhaul of the current system for learning to drive, covering pre-driver education, testing and maintaining driving skills through life (Department for Transport, 2008); and
- encourage local authorities to create more 20 mph zones and support applications for Home Zones.

Delivery of Staying Safe will be driven at a national level by a Child Safety PSA Board, which will monitor progress against national PSAs and the National Indicator Set (NIS) for local authorities on such matters as the number of people killed or seriously injured in road traffic accidents – including people aged 16–18 (NI 47) and children aged 0–15 (NI 48).³ Along with regional government offices, it will use these to identify and work with local authorities to make changes to improve outcomes against specific indicators. It is also envisaged that the Local Safeguarding Children's Boards (LSCBs) will be the key means of delivering improvements at a local level. A key aspect of the organisation of LSCBs is that many local organisations have to be members by law which, when trying to avoid/address deaths and injuries of children and young people, is generally viewed as a key development.⁴ Although it is too soon to determine what impact they are having, a recent review found that some LSCBs had not yet made the shift to a strategic/safeguarding role (instead remaining on a child protection/operational footing) which is the role it is intended that they perform if they are to make a positive impact on improving the outcomes experienced by children (Department for Education and Skills, 2008), so the way in which these initiatives develop will be of particular interest in the next 12 to 18 months.

These initiatives form part of a wider range of Government action to deliver improved outcomes for children and young people over the period to 2011. It is likely that during the course of the road safety and disadvantage research, the relevance of other specific initiatives (such as the introduction of School Travel Plans⁵) will become apparent.

In addition to monitoring emerging evidence (such as from the NRSI research) and developments in relevant initiatives, it will be important to also monitor developments in terms of progress against PSAs (including the NIS) and of the LSCBs.

¹ Details of ECM are available at www.dcsf.gov.uk/everychildmatters/

² The *Staying Safe: Action Plan* is available at www.dcsf.gov.uk/everychildmatters/safeguardingandsocialcare/safeguardingchildren/stayingsafe/stayingsafe/

³ A range of other indicators will monitor other aspects of delivery against the PSAs: www.communities.gov.uk/publications/localgovernment/nationalindicator

⁴ A range of Department for Education/Department of Health funded research on LSCBs is underway. This research may be able to be drawn on to gain an understanding of the relative priorities given to the different risks children and young people experience.

⁵ These form part of the Travel to School initiative, more details are available at www.dft.gov.uk/transportforyou/informationforparentteacher6173

1.3 Technical and methodological note

Reflecting their use in the wider literature, it is important to note that the terms ‘poverty’, ‘disadvantage’, ‘deprivation’, ‘social exclusion’ and ‘socio-economic group’ used in this report (and appendices) attract considerable debate as to their definition and merit. These terms are often used interchangeably with others, which can be confusing. It is not possible to go into detail on these issues here.

For the purpose of this report (and appendices), it is important to focus attention on the key issues as they impact on the conduct of the next stage of the road user safety and disadvantage project – that is, to identify case study areas in which there are high levels of deprivation and of deprivation-related road injuries/deaths. As such, the concern was more at an area level than an individual one – although it is important to note that, while it is likely that most people living in one of the most deprived areas could reasonably be considered disadvantaged, an individual-based measure of income-related poverty or socio-economic status might not place them in a similar relative ranking in the population.

As such, this report uses the terms ‘disadvantage’ and ‘deprivation’ to refer to the relative economic circumstances of people at an area level and that of ‘socio-economic group’ to refer to the relative employment status of an individual. On the former concept, most relevant analyses refers to ‘deprived neighbourhoods’ using data from the Index of Multiple Deprivation (IMD), which combines a number of indices chosen to cover a range of economic, social and housing issues into a single deprivation score for each small area in England and which allows each area to be ranked relative to one another according to their level of deprivation.⁶ On the latter concept, as per the wider literature on road safety, we use socio-economic status to refer to the individual level occupationally based classification of what, until recently, was referred to as ‘social class’⁷ – instead of using one of several definitions of poverty, including that definition adopted by the Government in its commitment to eradicate child poverty.⁸

1.4 What the evidence tells us

A key barrier to making progress on reducing the difference in casualty rates is that the robust evidence on the causes, especially on the factors underlying the risk of injury and death and of taking part in risky behaviours for particular groups (such as young people or people from minority ethnic populations), is often not available. Where it is available, it is often not sufficiently broad in scope to inform potential policy interventions. It is also often argued that detailed ‘exposure’ data are needed to fully understand differences in risk between different groups of people (in terms of age, gender and ethnicity) in different socio-economic groups and this information is not always available – and that, without it, the evidence cannot be sufficiently robust to support policy interventions.

However, the evidence currently available presents a strong message for policy makers and those attempting to reduce the number of casualties in deprived areas, albeit that it is not available for all groups. Overall, the evidence suggests that the elevated risk of road traffic injury among people in disadvantaged communities is linked to them:

- **living in more hazardous environments**, such as older style developments, which give rise to higher vehicle speeds and high levels of on-street parking;

⁶ For more information on the IMD see the Department for Communities and Local Government (2007). Other approaches, and how they are related to the IMD approach, are discussed in Morgan and Baker (2006).

⁷ See www.statistics.gov.uk/methods_quality/ns_sec/cat_subcat_class.asp for more detail.

⁸ The definition being ‘children in households at below 60% median equivalised income’ – see Townsend and Kennedy (2004) for more details and a discussion on how the definition of poverty relates to the concept of social exclusion.

- **living in areas with high levels of hazardous and illegal driving behaviour**, such as driving while impaired, without a seat belt and driving without entitlement or insurance;
- **having lifestyles with higher levels of exposure to environmental risk**, such as them being more likely to walk and less likely to be able to afford access to a car;
- **not having access to safe spaces and supervised facilities** for children and young people, meaning there are less alternatives to the street as places to socialise and play outside the home;
- **having low levels of understanding about the risks**, meaning that the current provision of advice in local areas may not be appropriately targeted or the messages are not reaching those most at risk or that they are not being acted upon; and
- **not accessing information about facilities and services** (especially parents), which may be that they do not have information about ways in which children can engage in safe and supervised activities in their free time.

For many specific groups of people in deprived areas, there is little robust evidence beyond basic descriptive statistical analysis. Although it should be noted that such analysis clearly sets out the scale and nature of the problem, it cannot explain why these differences may exist. There are relatively few studies focused on trying to develop a detailed understanding of the factors associated with the differences in injury and death among people from deprived areas. Most studies that have been conducted appear to have focused on the experience of children and young people as pedestrians and on the experience of young people as car occupants (whether as drivers or passengers) or motorcyclists. There is only limited robust evidence available on the factors associated with the higher risks experienced by other groups, such as people from minority ethnic populations, and very little on the experience of older people in disadvantaged areas. As such, the main focus of the remainder of this review is on the former two groups.

1.5 Children and young people as pedestrians

The evidence is clear that children in deprived areas have an elevated risk of injury and death compared with children living in more affluent areas, and that some of this additional risk relates to them living in more dangerous environments that result in them being exposed to higher levels of risk.

Although there has been a considerable decrease in recent years in the overall rates of death and injury, it remains the case that estimates of risk for child pedestrians aged under 15 in the lowest socio-economic class or most disadvantaged areas remain between three and five times that of children in the highest social class or most affluent areas (Broughton and Buckle, 2007; Graham *et al.*, 2005; Grayling *et al.*, 2002; Hippisley-Cox *et al.*, 2002; Roberts and Power, 1996). Boys in the lowest socio-economic groups are particularly at risk (Adams *et al.*, 2005). These ratios translate into estimated death rates of 20.6 (pedestrians) and 27.5 (cyclists) greater per 100,000 for children in families in the lower rather than higher socio-economic groups (Edwards *et al.*, 2006).⁹

The available evidence explains these differences by setting out that children in deprived areas:

- tend to live in urban, densely populated, older style areas with long straight roads which give rise to high traffic volumes, high vehicle speeds and high incidence of on-street parking (Brussoni *et al.*, 2008); and

⁹ This analysis used the new measure of social class (NS-SEC) in which social classes were categorised as: 1. Higher managerial and professional occupations; 1.1. Large employers and higher managerial occupations; 1.2. Higher professional occupations; 2. Lower managerial and professional occupations; 3. Intermediate occupations; 4. Small employers and own account workers; 5. Lower supervisory and technical occupations; 6. Semi-routine occupations; 7. Routine occupations; 8. Never worked and long-term unemployed.

- are more likely to walk due to them being less likely to live in households with access to a car, and they are also more likely to play out in the street and be unaccompanied by an adult on their journeys compared with children from more affluent households (Christie, 1995).

There is also evidence that children living in disadvantaged areas are more likely to live in households headed by single parents (where parental age, education and literacy levels are typically low), with a parent with a long-term health condition or disability (including a mental health condition) or in overcrowded accommodation with a greater than average number of siblings (Towner *et al.*, 2005). Although there is no robust evidence to 'prove' the case, it seems likely that these factors may influence or contribute to the injury risk faced by children in these areas in a number of ways. For example, parents/carers may be less able to supervise their children, less aware of risks and less able or disposed to access information and services to address these risks. In addition, the lack of play space within the house may mean that children need to play out in the streets more than those in other types of household or in other areas (Towner *et al.*, 2005).

Many people in minority ethnic populations share the same risk factors as those associated with the majority population living in deprived areas. For example, African Caribbean households are more likely than those in all other ethnic groups to be headed by a lone parent (Modood *et al.*, 1997; Coleman and Salt, 1996), maternal age and educational levels tend to be low among women in all minority ethnic populations and the experience of over crowding is higher in Pakistani and Bangladeshi households (1 in 3) and African Caribbean or Indian households (1 in 10) than in White households (1 in 50) (Brussoni *et al.*, 2008).

These findings are supported by the views of parents from in-depth research conducted in the most deprived areas. Parents commonly report that they have little information about services and facilities for their children. They also report that activities that are available are often difficult to access without a car and are also often unaffordable, especially when there are many children in a household who may wish to go. In addition, parents of children aged between 9 and 14 years in the most deprived local authorities in England, with the highest child pedestrian injury rates, say that they feel that there are not sufficient recreational spaces which are safe and secure and free from people involved in drug and alcohol misuse, gangs, dogs and the concomitant litter. They also note that children in the areas in which they live are particularly at risk in their free time (after school and during the holidays) (Christie *et al.*, 2007).

1.6 Young people as car occupants and motorcyclists

The evidence is clear that drivers in lower socio-economic groups and from the most deprived areas are more likely to be involved in fatal road traffic accidents than those in higher socio-economic groups or more affluent areas (while the analysis indicates that those in more affluent areas are more likely to be involved in more accidents overall, including those that are less serious), and that there is also some association with age. It is also clear that a large proportion of young pedestrians are killed or injured by local drivers.

Recent analysis (Ward *et al.*, 2007a) of 2001–04 UK road traffic collisions shows a link between the low socio-economic status of car occupants and the fatality risk at both an individual level (individual socio-economic classification) and area level (using area-based deprivation scores and police fatality data). Overall, it shows that car occupants from lower socio-economic groups are over-represented in fatalities: while three times as many people are classified in the top two social groups as are in the lowest social group (40% compared with 13%), they each account for a similar proportion of fatalities (22% and 20%, respectively).¹⁰ Further analysis using police fatal accident reports collected between 1994 and 2005 in Nottingham confirmed this national relationship at a local level, with male car

¹⁰ Groups 1 and 2 (higher and lower managerial and professional occupations) compared with Group 7 (routine occupations).

occupants aged 20–64 years from socio-economic Groups 1 and 2 much less likely to be fatally injured than those in other groups (Ward *et al.*, 2007b).

Analysis of UK police reports for 893 fatal vehicle occupant records from 1994–2005, by quintiles of deprivation using the IMD,¹¹ also showed significant differences between fatalities among people from the most deprived areas compared with the most affluent in terms of behaviours which contributed to fatal collisions (Clarke *et al.*, 2010). The analysis also raised a number of key issues which offer some possible explanations for these differences:

- **speed** – in the most deprived areas, there was twice the percentage of fatal crashes involving excess speed compared with the least deprived quintile;
- **impairment** – the most deprived IMD areas had over one in five of their fatal collisions involving alcohol or drugs as a contributory factor compared with one in six for the least deprived;
- **seat-belt wearing** – the most deprived IMD areas had nearly twice the percentage of non-seat-belt wearing fatalities compared with that of the least deprived areas, with the difference being even more pronounced for passenger fatalities;
- **licence violations** – fatalities involving driving licence violations were the most prevalent in the lowest IMD areas, with the percentage of unlicensed driving being over six times higher in IMD 1 compared with IMD 5; and
- **insurance violations** – the recorded rate of insurance violations in fatal collisions in the most deprived quintile was over three times higher compared with the least deprived quintile.

These findings are supported by the findings from in-depth research conducted in some of the most deprived local authority areas in England. Many of those who participated were strongly of the view that unlicensed, untaxed and uninsured drivers, and antisocial driving behaviour such as joy riding and street racing, pose a threat to community safety and quality of life (Christie *et al.*, 2007). These perceptions are themselves strongly supported by the available evidence, which highlights:

- uninsured drivers, who are not only more likely to be involved in incidents involving fatalities of occupants, but also have an elevated crash risk between 2.7 and 9 times greater than for all drivers, with the evidence indicating that they are probably involved in more severe collisions (Knox *et al.*, 2003); and
- over half of child pedestrian injuries involved a driver living in the same postcode area, with drivers aged 17–20 and 31–40 years over-represented in such incidents compared with the number registered nationally (Thompson *et al.*, 2003).

A commonly noted limitation of the studies which produced these data is the lack of information on 'exposure' (i.e. the extent of use of cars, motorcycles, etc.), which may explain some of the variation between groups. However, the analysis in Phase 1 of the Road User Safety and Disadvantage project addressed the issue of exposure in the statistics presented. As such, while some degree of caution is needed with some of the evidence to accommodate the issue of exposure, it is evident that young people in the lowest socio-economic groups generally face higher risks as car occupants (either as drivers or passengers) than those in higher groups, and that the risks they experience are very likely to be related to factors specifically associated with their disadvantage.

1.6.1 International evidence

The UK evidence about drivers in deprived areas being exposed to/taking additional risks is supported by the limited international evidence that is available. For example, evidence from Sweden indicates that young people from the most deprived socio-economic groups are more likely to take their driver's licence early than those in the more affluent groups – a factor

¹¹ The IMD quintiles were 1 (most deprived) to 5 (least deprived).

shown there to increase injury risk (Hasselberg and Laflamme, 2005) – and impairment due to alcohol or drugs is associated with high risks of injury for all drivers, but is more prevalent among drivers in lower socio-economic groups, with them having a 20–25% higher risk of fatal or serious injury compared with those in the most affluent highest group (Vaez and Laflamme, 2005).

It has also been found that drivers aged 18–30 years with low educational attainment (this is associated with low socio-economic status) are over-represented in all types of crashes and are also at greater risk of severe injuries. These socio-economic differences are particularly pronounced for ‘high-risk’ behaviours such as poor overtaking, front-on and single-vehicle collisions, which are also associated with the highest injury severity. Further analysis in respect of incidents involving motorcycles strongly indicates that there is a large age-dependent socio-economic difference in injury risk, with the highest incidence recorded among 17- and 18-year-olds in the lowest socio-economic groups (Hasselberg *et al.*, 2004).

There is no available robust evidence on the types of vehicle being used by drivers in the deprived areas in the UK or elsewhere, although it is often assumed that they are older and with less safety features than those used by more affluent drivers. However, the available evidence from Sweden suggests that:

- **in respect of motorcycles**, the lower risk for people from higher socio-economic groups may be attributable to them being more likely to have accessed better driving training, be able to afford newer and safer vehicles, be more able to maintain them, to use safety equipment, have higher levels of supervision given by their parents and have greater levels of familiarity with their vehicles (Zambon and Hasselberg, 2006); and
- **in respect of cars**, although the safest cars¹² were associated with the lowest casualties for people of all socio-economic groups, it appears to be the case that education level, exposure and environmental factors may provide better explanations of the increased risk among young drivers from low socio-economic groups (Laflamme *et al.*, 2004).

As such, the Swedish evidence indicates that ‘passive safety’ (such as air bags, side-impact protection) are likely to be ineffective in addressing socio-economic differential risk in respect of car drivers. Instead, it suggests that more ‘active’ systems, such as age-restricted access to driving training, raising standards of driver training, electronic licensing, collision warning or intelligent speed adaptation, may have more of a role to play.

1.7 Other groups

1.7.1 Minority ethnic groups

Nationally, evidence about the relationship between road traffic injury and ethnicity is limited because ethnic origin is not routinely collected by national injury databases and the broad ethnic categories often used, such as ‘White’, ‘Black’ and Asian, occlude important differences between ethnic groups (e.g. Steinbach *et al.*, 2008; Christie *et al.*, 2008). Some hospital-based studies and in-depth studies of police fatal reports have shown that Black and minority ethnic (BME) children are at increased risk of road traffic injury as pedestrians, especially under the age of 11 (see Thomson *et al.* (2001) for a review). However, it may be the case that the apparent elevated risk of road traffic injury for BME children may be confounded by socio-economic status because many BME residents tend to be the most deprived in society (Thomson *et al.*, 2001) and tend to cluster in specific areas, which are often areas of multiple disadvantage (Owen, 1992, 1994; Macintyre *et al.*, 1993; Sloggett and Joshi, 1994).

London is unique in the UK by measuring ethnic origin on police recorded casualty data. One study which looked at the relationship between deprivation and ethnicity found that casualty rates per head of population were highest in the Black and lowest in the Asian populations.

¹² Car safety took into account construction and the effectiveness of safety equipment such as seat belts and air bags, determined by an empirical assessment of the risk of sustaining an injury leading to death or disability after a collision.

Further analysis showed that White children (2.5 times) and Asian children (4 times) in the most deprived areas were more at risk of injury compared with children in the least deprived deciles. No relationship was found between deprivation and risk for Black children. Deprivation was found not to account for all the variation in injury rates between ethnic groups, but the evidence did not offer any further explanation as to why these differences might exist (Edwards *et al.*, 2008). One possibility raised is that it may be a consequence of little being known about whether there are cultural differences in exposure patterns between ethnic groups.¹³

This lack of a clear explanation is borne out by recent UK research in areas classified as being in the 15% most deprived which suggests wide differences between ethnic groups in reported collision rates, car ownership and the adoption of safety behaviours such as wearing a seat belt. In particular, it suggests that, overall, people from the BME population in deprived areas are significantly more likely to have access to a car in their household, less likely to report that they 'always' wear a seat belt in the back of a car, and to report being injured in a collision as a car occupant, and that some particular groups (notably Asian British) report being more likely to have access to a car in their household, as least as likely as the majority White population, to report that they 'always' wear their seat belt and have relatively high collision rates (Christie *et al.*, 2008).

There is some evidence to suggest that parental perception of the risks children face in traffic is different in 'non-White' families than among the White population. It suggests that there may be a poorer appreciation of risks among people in the BME population and that this may translate into less child supervision or teaching of appropriate traffic behaviours (Christie, 1995). This is supported by findings from in-depth research conducted with people from BME populations in London, which suggested that some Black community groups were not aware of the elevated risk of injury and did not want to be stigmatised as a 'problem' group (Steinbach *et al.*, 2008).

Overall, the evidence on ethnicity indicates that people in different ethnic groups may be differentially affected and react differently to the road environment, and to messages about road safety, especially in terms of risk perception. To address this, it is clear that more information is needed about how best to capture information about the experience and views of people from different ethnic groups, and how to engage with them with regard to intervention programmes to make the environment safer for all without stigmatising them.

Finally, it should be noted that the issue of how new immigrants living in deprived areas cope with the traffic environment is relatively unexplored.

1.7.2 Older people

While there is some evidence of higher rates of pedestrian injuries (Lyons *et al.*, 2003) among older people in disadvantaged areas, large gaps in knowledge exist that need to be addressed to enable proper programme planning and intervention to understand and address this.

It is thought that there may be a socio-economic gradient in travel patterns which may account for at least some of the differences in risk, in that older people from more deprived backgrounds are less likely to have access to a car (thereby increasing their reliance on walking and public transport) and a lack of transport accessibility is known to be disproportionately experienced by older people and people from low-income groups, especially those living in rural areas (Davis, 1998; Watt *et al.*, 1994).

1.8 Intervention approaches

There is good evidence that engineering which reduces the speed and flow of traffic has an important role in improving safety (Webster and Mackie, 1996). However, there is less

¹³ See Steinbach *et al.* (2008) for a discussion on how making efforts to understand risks from the community's perspective might help to make the environment safer for all.

evidence about how the creation of accessible, safe spaces such as parks and play areas impact on casualty reduction, especially among children. In addition, little is known about how the provision of recreational alternatives such as clubs and activities impact on the risk exposure of children and young people. The Neighbourhood Road Safety Initiative (NRSI) aimed to address these issues. The findings of the NRSI evaluation were published after this report was finalised (see Christie *et al.*, 2010).

There is limited evidence about the effectiveness of intervention programmes aimed at reducing risk in disadvantaged areas. However, reviews of evidence effectiveness have identified key features of interventions that are most likely to be successful (Brussoni *et al.*, 2008), as follows:

- **Comprehensive approaches that address broader problems** – factors at many different levels influence health and injury, including individual, social/community and general socio-economic, cultural and environmental factors. Interventions that address multiple levels – such that road safety is seen as relevant to other aspects of policy making and service delivery – are more likely to be successful
- **Multi-faceted approaches have a greater impact** – approaches that include educational, engineering and enforcement strategies are more likely to be successful in reducing injuries.
- **Inclusion of partners from across professions** – involving professionals from multiple agencies is more likely to address the many factors impacting on pedestrian injuries given that no one agency or area is likely to have the expertise and ability to address all aspects.
- **Engagement and involvement of the community** – interventions are more effective when they are tailored to the unique characteristics of the community (such as in terms of ethnicity) and involve community members in programme development and implementation.
- **Development of local information systems** – data at the local level are important to identify patterns in pedestrian injuries and to target interventions to ‘hot spot’ areas of high risk. Local data also enable evaluation of progress to determine whether implemented interventions are having the desired effect.
- **Integrated guidance from different government departments** – action at a local level can be very difficult if policy and guidance varies or is perhaps contradictory depending on the government department.
- **Flexibility at the local level** (including local authorities) – flexibility allows for possible joint funding of initiatives between departments and agencies, as well as creative thinking, encompassing a range of perspectives and experiences.

1.9 Implications for the Road User Safety and Disadvantage project

The statistical analysis of deprivation and collision data concluded by suggesting that the core phase of the study should focus on gaining an understanding of the risks faced by child pedestrians and young car occupants and motorcyclists. This conclusion is supported by the wider literature.

As such, the proposed scope for the next stage of research was a pragmatic one that focuses in on the areas in which there are known high rates of injury and death in road traffic accidents, and on which there is a developing body of evidence to which this research can add considerable value by gaining detailed insight from the perspective of the people living in these areas, in particular, from children and young people (and their families) themselves.

There are particular gaps in the evidence about how the creation of accessible, safe spaces (such as parks and play areas) and the provision of recreational activities in children’s free time impact on their exposure and casualty reduction. Although parent’s perceptions suggest

the lack of these may be a contributory factor in the risks their children experience, there is little robust evidence to support this.

Although the evidence is clear on the nature of the relationship between disadvantage and high-risk driving behaviours, little is known about the root causes (Reason, 1990) and what interventions might impact on, such as the lack of affordability associated with licensing, insuring and appropriate driving tuition, lack of education and awareness of risk, attitudes to safety behaviours, lack of enforcement, lack of parental involvement in the learning to drive process, and lack of parental role models. We also need to know what strategies those who drive without entitlement employ to avoid detection and how these behaviours vary among people in different groups (such as ethnic groups).

Many of these issues are highly sensitive and would need to be approached qualitatively with the full support and involvement of the community.

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