

# Road Traffic Injuries: Social Change and Development

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**Abstract:** In the course of the twentieth century road traffic injuries (RTIs) became a major public health burden. RTI deaths first increased in high-income countries and declined after the 1970s, and they soared in low- and middle-income countries from the 1980s onwards. As motorisation took off in North America and then spread to Europe and to the rest of the world discussions on RTIs have reflected and influenced international interpretations of the costs and benefits of ‘development’, as conventionally understood. Using discourse analysis, this paper explores how RTIs have been constructed in ways that have served regional and global development agendas and how ‘development’ has been (re-)negotiated through the discourse of RTIs and *vice versa*. For this purpose, this paper analyses a selection of key publications of organisations in charge of international health or transport and places them in the context of (a) the surrounding scientific discussion of the period and (b) of relevant data regarding RTI mortality, development funding, and road and other transport infrastructure. Findings suggest that constructions of RTIs have shifted from being a necessary price to be paid for development to being a sign of development at an early stage or of an insufficiently coordinated development. In recent years, RTI discussions have raised questions about development being misdirected and in need of fundamental rethinking. At present, discussions are believed to be at a crossroads between different evaluations of developmental conceptualisations for the future.

**Keywords:** Development, Global Health, Road Traffic Injuries, World Bank, World Health Organisation

## Introduction

All causes of death are equal in as much as they cause death. But some are less equal than others by being more overlooked, more taken for granted or more accepted as an inevitable part of life than others, which are more scandalising.

Road traffic injuries (RTIs) must be counted among the less equal. Their global health burden of causing more than 1.2 million deaths per year, corresponding to 2.4% of all global deaths, establishes them as a major global health threat, in a similar league with

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tuberculosis. However, until recently the response of the international health community appeared strangely muted. The ‘combined effort of the global community towards funding road safety is roughly estimated to be between US\$10–25 million per year’, a fraction of the sums spent on other public health issues of comparable significance.<sup>1</sup> International health organisations have never attempted eradication, have invested only few research funds and have, in fact, only discovered the issue about fifteen years ago although it had been around for decades.

How can this incongruity between health burden and effective response be explained?

Cars stand for a way of life which existed as the uncontested goal of all economic development for decades and for which alternatives continue to have a difficult time competing. Cars have therefore possessed a powerful significance as both signs and preconditions of supposed modernisation, progress and development. However, from the beginning, RTIs as a destructive side-effect of the motorisation of society has threatened this image. The spread of cars and RTIs as a public health issue has been accompanied by a parallel story of efforts to prevent, limit or control RTI morbidity and mortality, their tangible reality as well as their public image. In fact, in many ways, the rise of a car culture depended on the construction of an acceptable RTI narrative. As cars spread from industrialised countries to the rest of the world RTI narratives inevitably became part of the global development and modernisation discourse. In the process, discussions on RTIs have been both a reflection of and a contribution to the international construction of the costs and benefits of a key element of development.

‘Development’ and ‘modernisation’ are controversial expressions, fraught with interpretations of politics and history. Recent research underlines the socially constructed character of both concepts.<sup>2</sup> Critics see it as an imperialist policy by which high-income countries have fortified their economic superiority and their political control over low-income and often formerly colonised countries.<sup>3</sup> They call attention to the dramatically growing economic inequalities between high- and low-income countries despite – or because of? – decades of ‘development’ efforts allegedly designed to mitigate such disparity. Meanwhile, other scholars point to perceived successes of ‘development’, measured in health or social indicators such as life expectancy, infant mortality, gender equality or literacy rather than purely monetary data.<sup>4</sup> Other concepts do not easily lend themselves to this type of tally at all, notably Amartya Sen’s view of ‘development as freedom’ or Herman Daly’s insistence on ‘development’ as a strictly qualitative notion, to be distinguished from economic growth.<sup>5</sup>

This paper uses ‘development’ in a non-judgmental sense as an expression of the notion policy makers, stakeholders or the general public have had about the direction

<sup>1</sup> WHO, Global Plan for the Decade of Action for Road Safety 2011–20, undated, 20.

[http://www.roadssafetyfund.org/TagSymbol/documents/global\\_plan\\_en.pdf](http://www.roadssafetyfund.org/TagSymbol/documents/global_plan_en.pdf) (accessed 5 October 2012).

<sup>2</sup> Alexander Nützenadel and Daniel Speich (eds), Special Issue on Global Inequality and Development after 1945, *Journal of Global History*, 6, 1 (2011); David Engerman and Corinna Unger (eds), ‘Towards a Global History of Modernization’, Special Issue of *Diplomatic History*, 33, 3 (2009); Andreas Eckert, Stephan Malinowski and Corinna Unger (eds), ‘Modernization Missions. Approaches to “Developing” the Non-Western World after 1945’, *Journal of Modern European History*, 8, 1 (2010).

<sup>3</sup> Arturo Escobar, *Encountering Development* (Princeton, NJ: Princeton University Press, 1995); Gilbert Rist, *The History of Development*, 3rd edn (New York: Zed Books, 2010).

<sup>4</sup> Santosh Mehrotra and Richard Jolly (eds), *Development with a Human Face* (Oxford: Oxford University Press, 1998); Charles Kenny, *Getting Better* (New York: Basic Books, 2011).

<sup>5</sup> Amartya Sen, *Development as Freedom* (Oxford: Oxford University Press, 1999); Herman E. Daly, *Beyond Growth* (Boston: Beacon Press, 1996).

their country, other countries or the world at large should take and for which they seek to make decisions accordingly. Both high-income and low-income countries develop in the sense that they evolve over time and concepts about desirable socio-economic conditions, viewed as the target of ‘development’, influence this process. Concepts differ according to their perceived benefits and drawbacks at specific times and places, and this paper argues that RTIs have been an important element of the perceived advantages and disadvantages of motorised transport and the socio-economic system it represents. At the same time, the construction of RTIs has been affected by the perceived benefits of motorised transport and, in a larger sense, by the perceived benefits of the specific type of development which prevailed at the time when RTIs became an issue in the early twentieth century.

The development in North America after 1900, understood as ‘modernisation’, was marked by mechanisation, motorisation, increased provision with material goods, increased urbanisation, increased need for and ways of travel and life at an accelerating pace. These changes resulted from industrialisation in Europe and North America, a complex social transformation based on changing modes of production and consumption, changing power structures, changing forms of rural and urban living, and changes in medicine, food and technology. These changes relied heavily on the exploitation of fossil fuels, coal and increasingly oil, which made an unprecedented amount of energy available for a broad range of activities, especially for heavy industry used for warfare and transportation. Transport increased exponentially because railways and steamships provided the means and because intensified migration, trade and military campaigns created the need. The process entailed benefits and disadvantages for various groups of people at different times and places in volatile and sometimes contradictory ways. It improved nutrition, medical care, housing and opportunities for social mobility and political freedom for some and exacerbated it for others, within but especially between countries.<sup>6</sup> For the first time in world history, societies in Europe and North America were tangibly wealthier, more powerful and apparently healthier (though the reality was more complicated) than people in other parts of the world, many of whom, notably in Asia, had enjoyed similar or higher living standards than their European counterparts only a few generations earlier.<sup>7</sup>

Consequently, this development came to be perceived as ‘development’ in the sense of undergoing the combination of processes which encompassed a European-type industrialisation. After 1945, the countries in Europe and North America which were industrialised in this way were regarded as ‘developed’, others were believed to be in need of such ‘development’ and therefore became categorised as ‘developing countries’. Generally, ‘development’ was perceived as an economic concern and was placed under the responsibility of economists.<sup>8</sup> Thereby, it often came to be seen as synonymous with economic growth, defined as an increase in Gross National Product (GNP), a concept, which had just been invented.<sup>9</sup> Since this entire process appeared to go hand in hand with

<sup>6</sup> Jonathan Hart, *Empires & Colonies* (Cambridge: Polity Press, 2008), especially 171–4.

<sup>7</sup> Jack Goldstone, *Why Europe* (New York: McGraw Hill, 2009); Robert Marks, *Origins of the Modern World* (Landham MD: Rowman & Littlefield Publishers, 2002); Kenneth Pomeranz, *The Great Divergence* (Princeton, NJ: Princeton University Press, 2000); Jürgen Osterhammel, *Die Verwandlung der Welt* (München: C.H. Beck Verlag, 2009), 928–50.

<sup>8</sup> Richard Jolly et al., *UN Contributions to Development Thinking and Practice* (Bloomington, IN: Indiana University Press, 2004), 9.

<sup>9</sup> Daniel Speich, ‘The Use of Global Abstractions: National Income Accounting in the Period of Imperial Decline’, *Journal of Global History*, 6, 1 (2011), 7–28.

increased wealth, power and welfare it became widely accepted as a desirable process, or indeed the natural and only process towards improving well-being. This view was held by the vast majority of actors both in 'developed' and 'developing' countries, although motives ranged from the altruistic to the self-serving, and it is still held by leading economists today.<sup>10</sup> Considerations about how much of this process depended on finite fossil fuels and of making use of other regions' resources through imperialism were voiced repeatedly but generally marginalised or excluded from the mainstream discourse on 'modernisation', thus glossing over the fact that this process would be impossible to repeat on a global scale.

Meanwhile, RTIs are similarly complicated. While the deaths of people who die on the road are real enough, the concept of RTIs is no less of a construction than that of 'development'. RTIs are the result of a complex interplay of a series of components, including various traffic participants, vehicles, roads, the spatial, legal and logistic organisation of road traffic and medical care. Accordingly, RTIs can be constructed as the result of individual misbehaviour, corporate irresponsibility, lack of administrative regulation or control, insufficient public maintenance and medical services, misguided transportation arrangements, poverty, fundamentally flawed working and living configurations or just bad luck. These constructions are not trivial since they determine which RTI prevention strategies are chosen, placing the financial and political responsibility on some actors while relieving others. They determine how much money is spent where and for whom, or even if any money is spent at all. Depending on how well those respective constructions reflect the reality of deaths on the road, they also determine how many people die or stay alive.

Using discourse analysis, this paper explores how RTIs have been constructed in ways that have served local, regional and global development agendas and how 'development' has been (re-)negotiated through the discourse of RTIs and *vice versa*.

For this purpose, the paper analyses a selection of key publications of organisations in charge of international health or transport and contextualises them within (a) the surrounding scientific discussion of the period and (b) relevant data regarding RTI mortality, development funding, and road and other transport infrastructure.

### The Early Years of RTIs

Motorisation advanced in three waves. Between ca. 1910 and 1950 cars were concentrated in the USA, between 1950 and 1975 they became widespread in Europe and from 1960 onwards in the rest of the world, especially in Asia. In the process, the number of cars, trucks and motorbikes exploded from roughly one million cars in 1910 to 50 million (1930), 100 million (1955), 500 million (1985) and 777 million in 1997. It surpassed one billion in 2010. In addition, average driving distances expanded, further increasing overall traffic exposure.<sup>11</sup>

The modern automobile, driven by a combustion engine, was developed and first used in France and Germany, but it was in the USA that it first became part of everyday

<sup>10</sup> See, e.g., Vandana Chandra, Justin Yifu Lin and Yan Wang, 'Leading Dragons Phenomenon. New Opportunities for Catch-Up in Low-Income Countries', *Policy Research Working Paper* 6000, World Bank Institute, March 2012.

<sup>11</sup> John McNeill, *Something New under the Sun* (New York: WW Norton & Company, 2001), 60; John Sousanis, *WardsAuto*, [http://wardsauto.com/ar/world\\_vehicle\\_population.110815](http://wardsauto.com/ar/world_vehicle_population.110815) (accessed 5 October 2012).

life.<sup>12</sup> The beginning hardly foreshadowed upcoming developments. Two deaths due to motor vehicles were registered in Great Britain in 1896 and one in the USA in 1899.<sup>13</sup> Indeed, initially it did not seem that cars would spread beyond a small group of eccentrics. Early drivers in the USA were wealthy sportsmen who used cars to demonstrate ‘conspicuous leisure’. Their attitude outraged many Americans, some of whom reacted with ‘intense anger, and even acts of violence – often tinged with class hostility’.<sup>14</sup> Part of this resentment reflected the frustration of the have-nots watching the haves flouting their riches, but another part resulted from the experience that speeding motorists were becoming a danger to other street users. The number of cars grew, and stories of children being run over by reckless drivers or ‘joyriding’ chauffeurs made frequent, sometimes exaggerated, headlines in the press.<sup>15</sup>

Thus, RTIs formed part of discussions on automobiles from the beginning. They presented a more difficult problem than railway traffic, which had also caused new dangers to which travellers were unaccustomed, but where a strict separation of railway lines from the rest of the traffic, notably from pedestrians, had proved successful at reducing victims.<sup>16</sup> Such a separation was not practical for motorised cars and the question involved a renegotiation of space. The issue was less acute in the countryside where other road users were few and where the car was often the only means of rapid transportation and its advantages were obvious. It was here that the car, in the form of an affordable and unpretentious Model-T Ford, turned from a symbol of aggressive luxury to one of the social success of the hard-working man. Country doctors, who had the most need for fast and reliable transportation, often served as promoters of cars as respectable products.<sup>17</sup> Mass production brought the car within reach of most Americans, and between 1909 and 1920 the number of registered cars increased by 2750%.<sup>18</sup>

In the cities, which often had efficient means of public transportation already, cars had fewer obvious benefits and were more of a nuisance. Throughout the 1910s and 1920s, an angry animosity greeted cars, as traditional street users resented drivers who were perceived as disturbing the public order and as endangering people’s lives. Most urban RTI victims were pedestrians, and most of these were children. In marked contrast to later times, early observers blamed motorists for their deaths, not children who had played on the streets or parents who had failed to watch them. Children were expected to play on the streets without needing surveillance.<sup>19</sup>

Motorist interest groups fought their negative image. They portrayed drivers as a persecuted minority deserving protection and succeeded in redefining the issue away from one of injuries and death to one of freedom. Any restriction of the use of the car was constructed as inhibiting the people’s rights to choose their preferred means of transport and of street use.<sup>20</sup> In the process, they effectively reconstructed a street from a place

<sup>12</sup> Winfried Wolf, *Car Mania* (London: Pluto Press, 1996), 67–9.

<sup>13</sup> L.G. Norman, ‘Road traffic accidents’, *Epidemiology, Control, and Prevention* (Geneva: World Health Organization, 1962), 9.

<sup>14</sup> Tom McCarthy, *Auto Mania: Cars, Consumers, and the Environment* (New Haven, CT: Yale University Press, 2007), 7.

<sup>15</sup> *Ibid.*, 8–11, 27.

<sup>16</sup> Norman, *op. cit.* (note 13), 10.

<sup>17</sup> McCarthy, *op. cit.* (note 14), 36.

<sup>18</sup> McCarthy, *op. cit.* (note 14), 45–7.

<sup>19</sup> Norman, *op. cit.* (note 13), 11.

<sup>20</sup> Norman, *op. cit.* (note 13), 6 and 12.

of public service to a 'marketplace for transportation demands', an expression of a more modern economic outlook.<sup>21</sup> In a deliberate campaign the car lobby ridiculed pedestrians as 'jaywalkers' and thereby as less legitimate users of street space.<sup>22</sup> By the 1930s, years before cars became majority traffic participants, most people had accepted that streets were primarily for them.<sup>23</sup> In addition to determined lobby activities, the democratisation of car ownership changed attitudes. Increasingly, 'people bought their first cars, not just because they were useful as well as fun, but because their self-respect demanded it'.<sup>24</sup>

But the spread of motorised individual transportation was more than the sum of private decisions. Everywhere, governmental planning and the construction of an extensive system of overland roads preceded mass ownership of cars which could make use of it. In the USA, President Wilson signed the first large-scale highway building programme into law in 1916 with the Federal Aid Road Act, at a time when less than 4% of the population owned any type of motorised vehicle.<sup>25</sup> In Europe, widespread motorisation did not begin until the 1950s or even later but various measures spurred and anticipated future needs. In Germany, National Socialist policies of mass production of a 'people's car' and highways largely served purposes of military preparedness.<sup>26</sup> The Italian government similarly initiated a high-profile programme of highway building years before there were sizable numbers of drivers but discontinued the scheme during the economic depression.<sup>27</sup> In Great Britain and France, car ownership was no longer restricted to the most privileged class by 1938.<sup>28</sup>

The increase in cars went hand in hand with an increase in the burden of road traffic accidents.<sup>29</sup> In the USA the number of RTI deaths increased drastically, both in absolute and relative terms between the First World War and the 1930s. While rates declined slightly and remained relatively stable afterwards, the absolute number of RTI deaths decreased only during the years of war and then continued to climb until more than 50 000 people were killed in 1970 (Table 1). In Great Britain, RTI fatalities surpassed 7000 in 1930, 1933 and 1934, corresponding to a rate of approximately 15 per 100 000. This compared to a total of 9000 deaths caused by all types of traditional accidents (falls, drowning, burning etc.) in 1900. Unlike the USA, where RTI deaths receded during the Second World War, the British situation initially became more critical after 1939, when war-time blackouts exacerbated the pre-existing dangers of the road: 8000 people died on British roads in 1939, roughly 8,500 in 1940 and 9000 in 1941, approaching 18.8 per

<sup>21</sup> Norman, *op. cit.* (note 13), 13.

<sup>22</sup> Peter Norton, 'Street Rivals: Jaywalking and the Invention of the Motor Age Street', *Technology and Culture*, 48, 2 (2007), 331–59.

<sup>23</sup> Norman, *op. cit.* (note 13), 5.

<sup>24</sup> McCarthy, *op. cit.* (note 14), 41.

<sup>25</sup> Daniel J. Boorstin, *The Americans. The Democratic Experience* (New York: Random House, 1973), reprinted Penguin 1988, 271; US Bureau of Census, *The Statistical History of the United States* (New York: Basic Books, 1976), 8 and 716.

<sup>26</sup> Wolf, *op. cit.* (note 12), 97–101.

<sup>27</sup> Massimo Moraglio, 'Real Ambition or Just Coincidence? The Italian Fascist Motorway Projects in Inter-war Europe', *The Journal of Transport History*, 30, 2 (2009), 168–82.

<sup>28</sup> Gerold Ambrosius and William H. Hubbard, *Sozial- und Wirtschaftsgeschichte Europas im 20. Jahrhundert* (München: Beck Verlag, 1986), 76.

<sup>29</sup> For some years, the suitable terminology has been the object of debate, discussed further down in the text, as some authors prefer using 'crashes' or 'collisions' to 'accidents'. In order to avoid the impression that the difference of words in quoted sources and in the text somehow refer to different phenomena this paper uses all three expressions synonymously. They all describe an unintended collision involving at least one motorised vehicle.

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(a) USA 1913–1970		
Year	Number	Rate per 100 000 pop. (age-adjusted, base 1940)
Average of 1913–17	6 700	7.0
Average of 1918–22	12 500	12.3
Average of 1923–7	30 900	26.4
Average of 1928–2	21 700	19.6
Average of 1933–7	36 313	29.3
1943	23 823	17.7
1944	24 282	18.3
1946	33 411	24.0
1949	31 701	21.5
1950	34 763	23.3
1952	37 794	25.0
1955	38 426	24.6
1960	38 137	22.4
1965	49 163	26.5
1970	54 633	25.3
(b) USA 1990–2009		
Year	Number	Rate per 100 000 pop.
1990	44 600	17.9
1995	41 800	15.9
2000	41 900	14.9
2005	43 500	14.7
2009	22 800	11.0

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Table 1: Motor vehicle deaths and death rates. Sources: US Bureau of Census, *The Statistical History of the United States*, Introduction by Ben J. Wattenberg (New York: Basic Books, 1976), Series Q 208–209, p. 719; US Bureau of Census, Table 1103, <http://www.census.gov/compendia/statab/2012/tables/12s1103.pdf>.

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100 000. The numbers subsided afterwards, due to a drastic reduction of car ownership and available fuel.<sup>30</sup> Although these numbers were well below the rates experienced in the USA at the time, they were impressive when road casualties were compared to war casualties: 370 000 people were killed and wounded during the war, while 588 000 people were killed and injured on the roads during the same period.<sup>31</sup> The latter number never truly entered the collective memory.

After 1950, mass motorisation took root in Europe, and widespread car ownership formed part of a series of massive socio-economic transformations, based on cheap fossil fuels. Within one generation, patterns of housing, shopping, work and leisure time all reflected a society that relied increasingly on cars. Rising RTI numbers were part of this development, and they changed shape in the process. While initially accidents had primarily involved one vehicle and fixed objects or pedestrians, the rising presence of cars on the streets meant that collisions increasingly engaged several vehicles. In the UK, crashes involving three or more vehicles represented a mere 1.5% in 1936–7 but 4.7% in 1953. In the USA, deaths resulting from collisions of vehicles with fixed objects increased

<sup>30</sup> Bill Luckin, 'War on the roads: traffic accidents and tensions in Britain, 1939–45', in Roger Cooter and Bill Luckin (eds), *Accidents in History* (Amsterdam/Atlanta: Rodopi, 1997), 236; death rates calculated by author according to population numbers in Ambrosius and Hubbard, *op. cit.* (note 28), 15.

<sup>31</sup> Luckin, *op. cit.* (note 30), 244.

by 80% from 720 in 1930 to 1300 in 1952 but during the same period deaths resulting from collisions between two or more vehicles increased by 140% from 5880 to 14,100.

In the USA, as the number of cars increased, death rates in proportion to vehicles decreased, as did the proportion of victims resulting from collisions with pedestrians first in relative and eventually in absolute terms. From 1950 onwards, more people died in collisions between two motorised vehicles than in accidents involving vehicles and pedestrians. Similarly, the number of pedestrian deaths per registered motor vehicle roughly fell by half in Switzerland, Sweden, the UK and Ireland between 1947 and 1953.<sup>32</sup>

These changes led to a shift of concern about RTIs from pedestrians to drivers but also to an increasing acceptance of cars and RTIs. Even in pre-war Great Britain, pro-car and pro-pedestrian associations had competed for dominance while government policies tended to favour the affluent, i.e. car drivers.<sup>33</sup> After the Second World War, the widespread perception that the expanding car industry was instrumental to economic reconstruction as well as to social recovery provided automobiles with a positive connotation. This existing pro-car bias and the growing democratisation of car ownership complicated a perspective which focused on cars as the culprits of RTI mortality. Instead, discussions were muted and concentrated on 'the human factor'. In Great Britain, the discourse focused on pedestrian behaviour and pedestrians accepted that it was primarily up to them to adapt to an increasingly motorised environment. This discourse was complemented by a new perspective of speedy cars no longer as the source of road dangers but as a proud sign of modernity, which required similarly modern road systems.<sup>34</sup> Meanwhile, in the USA, attention still concentrated on drivers. Automobile associations and insurance companies organised driver education courses, designed to turn car users into 'safe drivers', while local administrations established and police enforced regulations which should ensure that driver behaviour was conducive to road safety.<sup>35</sup> RTIs were perceived as a form of dysfunction, caused by individual traffic participants who were insufficiently adapted to the demands of modern life.

### The Construction of a Public Health Issue

Remarkably, during the first half of the twentieth century RTIs never appeared as an international public health issue. The League of Nations, which pioneered data collection and assessments of the state of public health around the world, completely ignored RTIs.<sup>36</sup> It was only in the 1950s, after the USA had recorded its millionth RTI death (in 1951) that the international community began to take note.<sup>37</sup> The United Nations (UN) Economic Commission for Europe began publishing detailed annual road traffic statistics (the *Statistics of Road Traffic Accidents in Europe*) for eighteen European countries.<sup>38</sup> In 1957, the First International Congress of Traffic Police, held in Eindhoven, discussed

<sup>32</sup> US Bureau of Census, *The Statistical History of the United States*, Introduction by Ben J. Wattenberg (New York: Basic Books, 1976), Series Q 227–32, 719–20; McCarthy, *op. cit.* (note 14), 25.

<sup>33</sup> Luckin, *op. cit.* (note 30), 234–55.

<sup>34</sup> Luckin, *op. cit.* (note 30), 244–7.

<sup>35</sup> Jameson M. Wetmore, 'Redefining Risks and Redistributing Responsibilities: Building Networks to Increase Automobile Safety', *Science, Technology, & Human Values*, 29, 3 (2004), 377–405: 382.

<sup>36</sup> Iris Borowy, 'World health in a book – the League of Nations international health yearbooks 1925–30', in Iris Borowy and Wolf D. Gruner (eds), *Facing Illness in Troubled Time Health in Europe in the Interwar Years, 1918–1939* (Berlin: Peter Lang Verlag, 2005), 85–128.

<sup>37</sup> Norman, *op. cit.* (note 13), 9.

<sup>38</sup> Norman, *op. cit.* (note 13), 23.



road safety measures. In line with prevailing attitudes, its recommendations focused on the weakest of potential victims, calling for better education of pedestrian road users, especially of children.<sup>39</sup>

Meanwhile, the World Health Organisation (WHO) discovered RTIs as a health issue and began defining it in those terms. As a start, it carried out a survey regarding motor vehicle accidents. Forty-seven member states returned questionnaires: between them they had recorded 102 552 deaths that year (79 810 of them males) out of a population of 650 million people, and numbers were rising. No records existed regarding the much larger number of people who were injured, often seriously. It became clear that RTIs affected predominantly young males and children where they took a staggering toll:

... in Canada, the United States, Austria, the Netherlands, Australia, and New Zealand, deaths from motor vehicle accidents in males in 1958 exceeded those due to tuberculosis (all forms), acute poliomyelitis, typhoid fever, diphtheria, and diabetes mellitus added together. Among females in these countries fatal road traffic accidents were fewer but were still prominent among the causes of death.<sup>40</sup>

In the UK, RTIs killed fifteen times as many children as poliomyelitis in 1956, and twice as many as during the worst polio epidemic after 1945. In a complaint that was to be repeated many times during the following decades, the author of a study observed that these numbers aroused a fraction of the interest of that directed at other epidemics.<sup>41</sup> The WHO tried to raise the awareness of this invisible health issue, dedicating its 1961 World Health Day to the theme of 'Accidents and Their Prevention'.<sup>42</sup> It also commissioned a study on *Road Traffic Accidents*.

This report, written by the Chief Medical Officer of the London Transport Executive, was published by the WHO in 1962 under the sub-title of 'Epidemiology, Control, and Prevention' and declared that RTIs constituted 'a public health problem of the first magnitude'.<sup>43</sup> But comparisons between countries, and, indeed, an assessment of the burden, were difficult since definitions varied widely. In Belgium, for instance, road traffic deaths described deaths which occurred at the site of the accident only, while in England, deaths occurring up to 30 days after the accident entered into the statistics.<sup>44</sup> What was clear, however, was that there were gender- and age-specific differences regarding RTI risks. The most striking element then – as later – was the gender gap. In all participating countries, the ratio of male to female road traffic deaths ranged between three and five and, the author of the 1962 WHO study observed, resembled a 'biological or sociological law', so far little understood.<sup>45</sup> The age distribution differed between traffic participants. Among pedestrians, children between roughly 1 and 10 were particularly at risk; prevalence then declined and rose again from age 65 onwards. The increase in old age resulted in part from the high probability of elderly people dying from injuries from which younger people recovered.<sup>46</sup> However, within the age bracket of young adults, RTIs represented a major cause of death, causing 'a serious economic loss to the community'.<sup>47</sup>

<sup>39</sup> Norman, *op. cit.* (note 13), 10.

<sup>40</sup> Norman, *op. cit.* (note 13), 13–14.

<sup>41</sup> A.M. Johnston, 'Social Patterns of Road Accidents to Children', *British Medical Journal*, Feb 14 (1959), 409–13.

<sup>42</sup> Norman, *op. cit.* (note 13), 7.

<sup>43</sup> Norman, *op. cit.* (note 13), 17.

<sup>44</sup> Norman, *op. cit.* (note 13), 23.

<sup>45</sup> Norman, *op. cit.* (note 13), 28, also 29.

<sup>46</sup> Norman, *op. cit.* (note 13), 31.

<sup>47</sup> Norman, *op. cit.* (note 13), 16–17.

While RTIs, therefore, slowed down economic development in tangible, although unquantified ways, the essential role of the motorisation industry for economic growth was obvious. The report commented that evidently RTIs took an increasing part of national mortality as a country became 'more highly developed and therefore more highly motorised'.<sup>48</sup> The connection between development and motorisation appeared too obvious even to suggest a cost–benefit analysis. Despite his urgent calls to address RTIs as a public health threat, the author was ready to accept a certain level of RTIs as an inevitable side-effect of modernisation, and he merely suggested that 'a balance between man and the new element in his environment, the motor vehicle, is being reached, and that a mortality of roundly 20 per 100 000 per annum is the price of introducing the motor vehicle on a large scale'.<sup>49</sup> Thus, in the early 1960s, a cost of 20 lives lost for every 100 000 people seemed an acceptable price for the benefit of modernisation, a rate reached in the USA during the late 1930s and then briefly again in 1948, but which had consistently been surpassed since.

Meanwhile, the perception of RTIs as a public health issue remained concentrated in North America and Europe where it gradually changed its character. In the late 1950s, a diverse group of public health experts, politicians, lawyers and social activists began arguing that 50 000 RTI victims annually were unacceptable and that car designs, which did not prioritise safety, bore a large part of the responsibility for the number of casualties. They argued that getting drivers to act more responsibly was clearly not succeeding while making cars 'crashworthy' by supplying them with padded dashboards and stronger door locks would have instant effects. The political climate of social discussions and the civil rights movement of the time were propitious for the argument that people's well-being went beyond the control of the individual. The public was introduced to the new arguments through congressional hearings and, above all, in Ralph Nader's book *Unsafe at any speed*, published in 1965. The car industry, fearing expensive construction changes and liability claims, tried to portray the issue as one of personal freedom. This strategy remained unsuccessful in part, because insurance companies could be drawn over to the other side of the argument.<sup>50</sup> One year later, Lyndon Johnson signed into law two bills raising safety standards in cars and roads, and established a new federal agency, the National Highway Safety Bureau (NHSB), in charge of RTI control.<sup>51</sup>

These events marked an important shift in how the causes for RTIs were defined, with ambivalent effects. On the one hand, it weakened a perspective which blamed RTI victims for their fate. Thus, shifting attention to cars can be seen as a correction to a situation where the industry had largely been exempt from any accountability. On the other hand, a growing focus on vehicle safety spurred the expectation of technical fixes. This new reductionist view of the problem became obvious during the more recent controversy regarding airbags, which became mandatory in the USA and whose overall benefits remained unclear. This development has been blamed for a neglect of behavioural factors

<sup>48</sup> Norman, *op. cit.* (note 13), 14.

<sup>49</sup> Norman, *op. cit.* (note 13), 24.

<sup>50</sup> Wetmore, *op. cit.* (note 35), 384–9; Julian Waller, 'Reflections on a Half Century of Injury Control', *American Journal of Public Health*, 84, 4 (1994), 664–70; Ralph Nader, *Unsafe at any speed, The Designed-In Dangers of The American Automobile* (New York: Grossman Publishers, 1965).

<sup>51</sup> Richard Dahl, 'Vehicular Manslaughter: The Global Epidemic of Traffic Deaths', *Environmental Health Perspectives*, 112, 11 (2004), A629–A631: A631.

and, ultimately, for a relatively less positive development in the USA, compared to other industrialised countries.<sup>52</sup>

The change of perspective paved the way for a view of economic development not as a cause of RTIs, i.e. the problem, but as its solution. And eventually, the focus on vehicles established the view of drivers being the primary victim of RTIs deserving protection. No similar technical considerations were directed at protecting pedestrians, who, by that time, had been driven out of large part of public spaces. Implicitly, this was criticised by William Haddon, an American epidemiologist who developed a systemic approach to RTIs which integrated considerations of infrastructural factors with vehicles and users in the pre-crash, the crash and post-crash stages relevant to road traffic accidents.<sup>53</sup> This ‘Haddon Matrix’ was criticised but spurred a shift towards a more comprehensive perspective of traffic and RTIs in the 1970s and would re-emerge in a transformed shape in the late 1990s.

As urban centres in industrialised countries experienced an increasing burden of traffic congestion with its economic, environmental and social costs as well as ever-increasing RTIs, many cities took measures designed to reduce the motorised traffic on their territory. A study of the Organisation for Economic Cooperation and Development (OECD) of twelve cities in as many countries revealed that, by the mid-1970s, eleven had restricted parking in their centres, eight had increased the frequency of public transportation services, ten had provided preferential treatment for public services (such as bus lanes etc.), ten had established pedestrian zones and five had made provisions for cyclists. These measures had reduced RTIs substantially, sometimes spectacularly. Thus, Nagoya reduced RTIs by 61% and RTI mortality by 59% in its central business district within a few years. Even Paris, which saw its overall RTI rate go up by 52%, enjoyed a reduction of RTI mortality by 24%. In Ottawa, where overall RTIs increased by 19%, the RTI rate decreased by 40% in those areas where measures to reduce transit traffic had been put in place.<sup>54</sup> These changes could not gloss over the fact that private cars were still considered ‘the predominant mode of personal travel in North America’ and were gaining ground in many areas of Europe and Japan.<sup>55</sup> Nevertheless, in a curiously contradictory development, the number of cars kept increasing while cars were no longer automatically considered the best or the most modern means of transportation everywhere in high-income countries, and pedestrians regained some of the urban ground from which they had been evicted some decades before.

At about that time, the WHO began addressing RTIs more seriously. In 1974, the World Health Assembly acknowledged the ‘extensive and serious individual and public health problems resulting from road traffic accidents’ and urged national health authorities to provide leadership in the issue. In its proposals of tangible measures the resolution remained well within the paradigm of the last decades, calling for ‘improved driver licensing standards and traffic safety education programmes’ and the application of ‘safety

<sup>52</sup> Leonard Evans, ‘Traffic Crashes’, *American Scientist*, 90, 3 (2002), <http://groupsites.ius.edu/physics/~kyle/P310/articles/trafficrisk.html> (accessed 5 October 2012); regarding the airbag controversy see also Wetmore, *op. cit.* (note 35), 390–8.

<sup>53</sup> William Haddon Jr, ‘The Changing Approach to the Epidemiology, Prevention, and Amelioration of Trauma: The Transition to Approaches Etiologically Rather than Descriptively’, *American Journal of Public Health*, 58 (1968), 1431–8.

<sup>54</sup> OECD, Environmental Committee, ‘Rapport sur les politiques de gestion des transports urbains visant à améliorer l’environnement’, ENV(78)18, 20 March 1978, OECD archive.

<sup>55</sup> OECD Environment Committee, ‘Better Use of Vehicles. Final Report’, ENV(81)26, 13 Nov 1981, OECD archive.

principles in the development of new types of vehicles'.<sup>56</sup> The Regional Office for Europe was made responsible for the WHO programme on road traffic accidents.<sup>57</sup> However, probably this office observed more than they caused the substantial RTI decline which was unfolding around them. Between 1975 and 1998, RTI mortality decreased drastically in virtually all high-income countries: by 63.4% in Canada, by 58.3% in Sweden and by 27.2% in the USA.<sup>58</sup> In 1987, a public health expert stated that a 200-fold increase of cars had been accompanied by an only twenty-fold increase in RTI deaths and that the RTI death rate was lower in 1985 than at any time during the preceding sixty years except in 1948. Impressed, he commented: 'The epidemic of road traffic deaths may be most remarkable for the way it has been controlled.'<sup>59</sup>

Unfortunately, this assessment overlooked the majority of global regions and people. In fact, RTIs were fast developing into a global issue with an immense public health burden concentrated in middle-income countries. Between 1975 and 1998, RTI deaths increased by 237.1% in Colombia, by 243% in China and by 383.8% in Botswana. In 1990, RTI assumed place nine in contributors to the global burden of disease. Globally, road traffic deaths increased from ca. 990 000 per year in 1990 to nearly 1.2 million in 2002.<sup>60</sup>

In the late 1980s, international organisations gradually became aware of the extent of the evolving problem and of the need to address it. Given that North America and Europe looked back on decades of experience and that RTIs appeared to show a positive downward trend, there was a natural tendency to apply lessons learned in the 'developed' world to problems encountered in 'developing' countries. But what exactly were they? Had RTI rates declined because of better drivers, more stringent regulations, safer vehicles, better protection for cyclists and pedestrians, more alternatives to travelling by car, medical progress or simply because the sheer number of cars provided the majority of traffic participants with a protective frame, so that cars served as both protection against and as threats to other cars and their passengers? Or any combination of those factors? And which of these findings were applicable to the rest of the world, to whose benefit and at what price? Discussions evolved around competing claims to historical analysis and their conclusions for development policies in those countries where car traffic was still low but rising.

In many ways, the situation in low-income countries at the end of the twentieth century resembled that of countries in Europe and North America at its beginning: RTI victims were primarily pedestrians and cyclists, vulnerable traffic participants who competed with an increasing number of motorised vehicles for road space. But there were also distinct differences. Researchers listed a fateful combination of reasons for the rising RTI burden, including a 'traffic mix of incompatible users (pedestrians, cyclists, motorbikes, cars, and trucks) with, for example, communities living within the vicinity of roads or the lack of pavement along large urban streets'.<sup>61</sup> Passengers in Africa and Asia usually rode in multi-

<sup>56</sup> WHA27.59 Prevention of road traffic accidents. Twenty-seventh World Health Assembly, Geneva, 7–23 May 1974. [http://www.who.int/violence\\_injury\\_prevention/resources/publications/en/WHA2759\\_eng.pdf](http://www.who.int/violence_injury_prevention/resources/publications/en/WHA2759_eng.pdf) (accessed 30 September 2011).

<sup>57</sup> WHO, *The Third Ten Years of the World Health Organization 1968–1977*, written by Socrates Litsios (Geneva: WHO, 2008), 74.

<sup>58</sup> Margie Peden *et al.* (eds), *World Report on Road Traffic Injury Prevention* (Geneva: WHO, 2004), 37.

<sup>59</sup> Richard Doll, 'Major Epidemics of the 20th Century: From Coronary Thrombosis to AIDS', *Journal of the Royal Statistical Society. Series A (General)*, 150, 4 (1987), 373–95, quote in abstract.

<sup>60</sup> Peden *et al.*, *op. cit.* (note 58), 37.

<sup>61</sup> Emmanuel Lagarde, 'Road Traffic Injury Is an Escalating Burden in Africa and Deserves Proportionate Research Efforts', *PLoS Medicine*, 4, 6 (2007), 968.

passenger vehicles such as overloaded mini-buses or taxis, so that individual accidents involved more people than the typical accident in a high-income country, which had usually affected the driver(s) of one or several cars involved. Comparing RTIs in different parts of the world in 2000, this difference was exacerbated by the lack of effective first aid and emergency medical care in low-income countries. According to a Harvard study 10 000 crashes resulted in 66 deaths in the US, but 1786 in Kenya and 3181 in Vietnam.<sup>62</sup>

Gradually, international institutions began to become aware of the issue. Given the complex nature of RTIs, they could not but become part of the tension between different international health agendas. By the 1980s, international health was no longer the domain of the WHO alone. A new major player was the World Bank, which had been alerted by WHO efforts at the conference of Alma-Ata in 1978 to connect public health policies to demands for increased global economic equality and regulations, while growing neoliberal tendencies among key members, notably the USA, called for further economic deregulations. During the 1980s and 1990s, the World Bank steadily increased its role in the international health scene. Through substantial investment in health projects and the generation of health-related data it integrated health into its overall programme of fostering a market-driven form of economic development.<sup>63</sup> Part of this strategy was to identify poverty reduction through economic growth as the primary means of improving public health in low-income countries, and research programmes were designed accordingly.<sup>64</sup> This situation gave rise to the Global Burden of Disease Project, which the World Bank launched in preparation of its 1993 World Development Report *Investing in Health*, which successfully established the work of the World Bank as a reference point for global health.<sup>65</sup> The Global Burden of Disease Project introduced disability adjusted life years (DALYs) as new measurement unit, which combined mortality, morbidity and injury into a single number. The resulting data revealed RTIs as an unexpectedly important health burden. Road traffic accidents ranked ninth among the leading causes of DALYs, accounting for 2.4% of the total.<sup>66</sup> Even more surprising – at least to the authors of the study – road traffic accidents were the second leading cause of DALYs for men between 15 and 44 year of age in high as well as in low income countries.<sup>67</sup> These data prompted a growing number of research publications dedicated to RTIs in the following years. In line with the perspective begun in the 1962 WHO report, publications constructed RTIs in medical terms as a ‘neglected epidemic’,<sup>68</sup> a ‘global epidemic’,<sup>69</sup> a ‘global road trauma

<sup>62</sup> Dahl, *op. cit.* (note 51), A630.

<sup>63</sup> Ted Brown, Marcos Cueto and Elizabeth Fee, ‘The World Health Organization and the Transition from “International” to “Global” Public Health’, *American Journal of Public Health*, 96, 1 (2006), 67–8; Meri Koivusalo and Eeva Ollila, *Making a Healthy World* (London: Zed Books and Helsinki: STAKES, 1988), 42–5.

<sup>64</sup> Iris Borowy, ‘Global Health and Development: Conceptualizing Health between Economic Growth and Environmental Sustainability’, *Journal of the History of Medicine and Allied Sciences*, first published online March 30, 2012, doi:10.1093/jhmas/jrr076.

<sup>65</sup> The World Bank, *Investing in Health*, World Development Report 1993 (Oxford: Oxford University Press, 1993).

<sup>66</sup> Christopher J.L. Murray and Alan D. Lopez, ‘The global burden of disease in 1990: final results and their sensitivity to alternative epidemiological perspectives, discount rates, age-weights and disability weights’, in Christopher J.L. Murray and Alan D. Lopez (eds), *The Global Burden of Disease* (Harvard University Press, 1996), 260.

<sup>67</sup> *Ibid.*, 268.

<sup>68</sup> V.M. Nantulya and M.R. Reich, ‘The Neglected Epidemic: Road Traffic Injuries in Developing Countries’, *BMJ*, 324 (2002), 1139–41.

<sup>69</sup> Dahl, *op. cit.* (note 51), A629–A631.

pandemic'<sup>70</sup> or compared RTIs to Aids, insisting that one epidemic provided lessons for fighting the other.<sup>71</sup> Some publications invoked warfare, describing RTIs as 'vehicular manslaughter'<sup>72</sup> or a 'war on the roads'.<sup>73</sup>

However, this health discourse had a hard time competing against the entrenched view of roads and road traffic as essential economic infrastructure. The 1994 World Bank World Development Report on *Infrastructure for Development* was a case in point. It acknowledged that RTIs were a leading cause of death in low-income countries and accorded governmental 'regulation to preserve safety standards in infrastructure service provision and delivery' an important priority.<sup>74</sup> Another paragraph observed the 'very low rates of traffic accidents' which the Brazilian city of Curitiba had achieved through 'carefully designed public transport routes'.<sup>75</sup> However, those were the only references to road crashes and could easily be overlooked in the midst of a report which, otherwise, overwhelmingly discussed the need for optimal cost-effectiveness of infrastructure services, ideally through privatisation. Ironically, this preference for market solutions for development challenges should have provided grounds for the World Bank to favour investments in railway lines and other forms of collective transport rather than roads. Railways, bus services, subways etc. could easily be supplied by private operators or under concessions, working under conditions of competition and, therefore, supposedly more efficiently and cost-effectively. The privatisation of roads was sometimes possible as toll roads, but in general roads would necessarily remain public spaces.<sup>76</sup>

But these theoretical considerations clearly had little effect on real lending decisions. Since the 1970s, World Bank commitments for transportation infrastructure had increasingly concentrated on highway building, which effectively dwarfed the sums spent on railway lines. Investment in urban transport were non-existent or a fraction of those for highways and also consisted largely of road constructions. This tendency would continue and even intensify in the beginning of the twenty-first century. The sums invested in rural and urban roads amounted to 80% of all infrastructure lending (Figure 1(a) and (b)). The World Bank was not the only source of global investments in transportation infrastructure but its distribution of funds was reflected in the development of road and railway lines in many countries, including El Salvador, Malawi, Brazil and India. (Figure 2(a) and (b)). Invariably, the length of paved roads increased substantially, sometimes dramatically, between 1960 and 2000 while that of railway lines stagnated. If any funds were spent on infrastructure supporting non-motorised transportation, such as buses, trams, subway or even secure sidewalks or bicycle lanes, they were considered too insignificant to be mentioned in World Bank publications. Clearly, although a large part of the population in low-income countries had no chance of ever owning cars, motorised road traffic had become the accepted model for transport development. Meanwhile, RTIs were becoming an increasingly pressing concern. A precise understanding of the situation was difficult since data were – and still are – often patchy or simply non-existent, but those that were available were impressive enough. Examples included El Salvador and Mauritius, both

<sup>70</sup> Ian Roberts, Dinesh Mohan and Kamran Abbasi, 'War on the Roads', *BMJ*, 324 (2002), 1107–8.

<sup>71</sup> Dahl, *op. cit.* (note 51), A631.

<sup>72</sup> Dahl, *op. cit.* (note 51), A629–A631.

<sup>73</sup> Roberts *et al.*, *op. cit.* (note 70), 1107–8.

<sup>74</sup> World Bank, *Infrastructure for Development*, World Development Report 1994 (Oxford and New York: Oxford University Press, 1994), 84.

<sup>75</sup> *Ibid.*, 22.

<sup>76</sup> *Ibid.*, 94–8, 120.

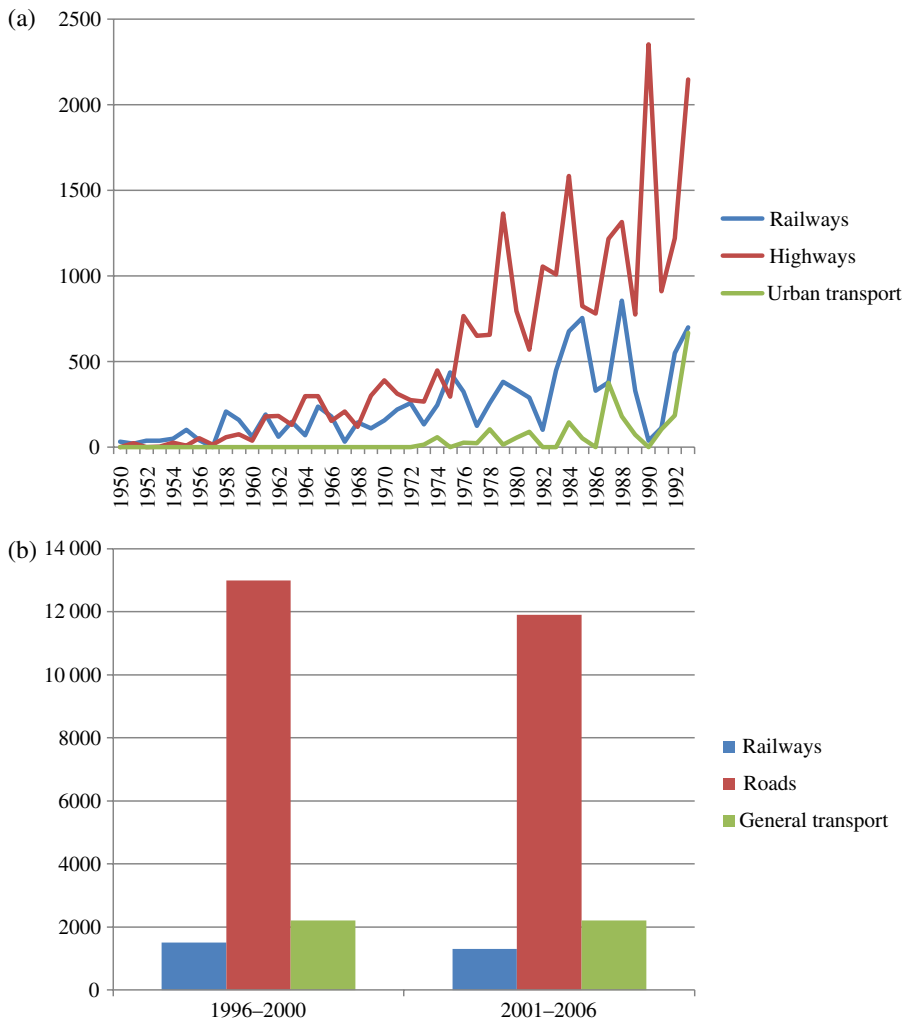


Figure 1: IBRD and IDA commitments: (a) millions of current US dollars. Source: World Bank, *Infrastructure for Development*, World Development Report 1994 (Oxford and New York: Oxford University Press, 1994), 149; (b) millions of US dollars. Source: World Bank Evaluation Group, *A Decade of Action in Transport* (Washington DC: World Bank, 2007), 23. 'General transport' corresponded to 'urban transport' and consisted predominantly of roads.

of whom experienced rapidly rising RTIs mortality rates even though the length of paved roads in Mauritius expanded only slightly from 1593 to 1699km between 1970 and 1990.<sup>77</sup> (Figure 3).

In 1998, the International Federation of Red Cross and Red Crescent Societies presented warnings about the seriousness of RTIs as a 'hidden global epidemic' in its World

<sup>77</sup> *Ibid.*, 141 and 144.

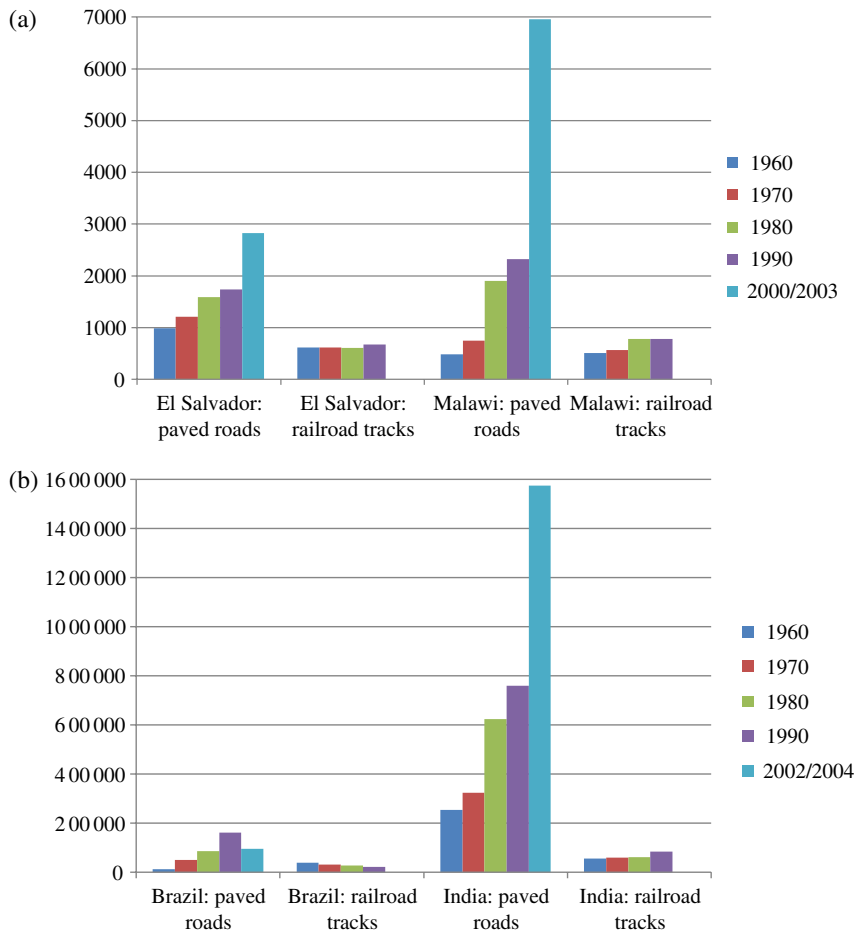


Figure 2: Railways tracks and paved roads in kilometres: (a) El Salvador and Malawi; (b) Brazil and India. Source: World Bank, *Infrastructure for Development*, World Development Report 1994 (Oxford and New York: Oxford University Press, 1994), 140–145; CIA World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/fields/2085.html#182>. International Road Federation, *World Road Statistics 2007*, Data 2000–2005, Geneva 2007.

Disaster Report.<sup>78</sup> In response, the World Bank established the Global Road Safety Partnership (GRSP), a network of representatives of business, civil society and government organisations. Its membership read like the who's who of the international car and oil industry, including General Motors, Honda, BP, DaimlerChrysler AG, Michelin, Renault, Shell, Total and Toyota. Several governments and international organisations, including the WHO, were also represented. The group was hosted by the International Red Cross, which provided contacts and credibility, and it was overseen by a Steering Committee.<sup>79</sup>

<sup>78</sup> International Federation of Red Cross and Red Crescent Societies, *World Disasters Report 1998* (Oxford: Oxford University Press, 1998).

<sup>79</sup> Tamara Bekefi, 'Global Road Safety Partnership and Lessons in Multisectoral Collaboration. A report to the Corporate Social Responsibility Initiative', undated, [http://www.daedalusadvising.com/Road\\_Safety\\_Business\\_Partnership.pdf](http://www.daedalusadvising.com/Road_Safety_Business_Partnership.pdf) (accessed 8 December 2011).



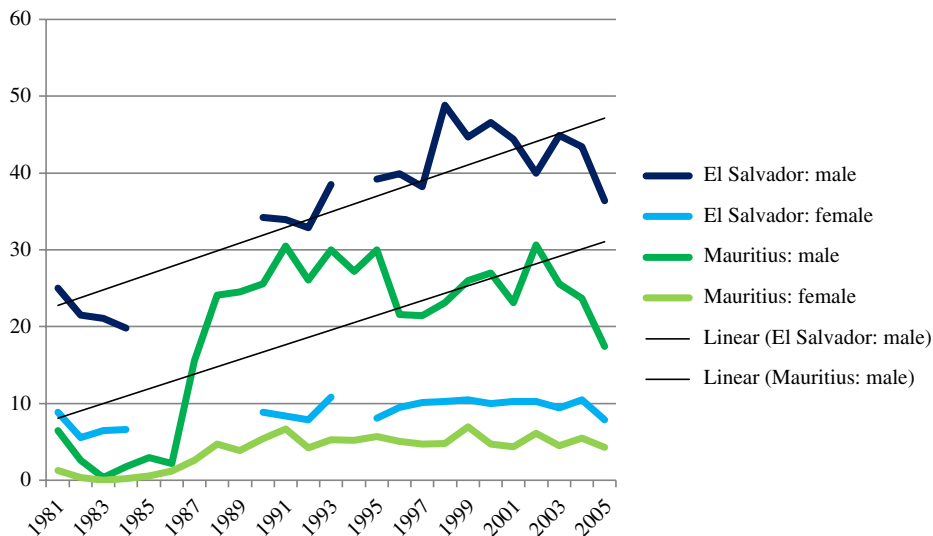


Figure 3: The crude death rate due to motor vehicle traffic accidents: El Salvador and Mauritius. Deaths per 100 000 population. Source: WHO Mortality Database.

Within some years it supported practical road safety projects in several countries around the world. Activities ranged from targeting drunk-driving and speeding to promoting the use of helmets and seat-belts to separating motorised and non-motorised traffic or promoting public transportation.<sup>80</sup> However, the main focus was on the behaviour of potential victims, portrayed as those most responsible for RTI deaths. Children, particularly, were described as lacking sufficient skills and knowledge to cope with complex road traffic situations. This line of argument had formed part of the conventional wisdom in high-income countries since approximately the 1940s, but it was quickly becoming outdated. A 2002 meta-study of controlled trials of pedestrian education programmes in high-income countries showed no evidence that such programmes reduced the risk of road accidents involving child pedestrians. No similar studies existed for low-income countries.<sup>81</sup>

Including representatives of the automobile industry in this group brought technical expertise and assured close contact with those actors whose actions inevitably formed an important component of any road safety programme. But obviously their presence also precluded solution strategies which questioned motorisation in principle. In 2002, the secretariat for the Steering Committee was shifted to the Task Force for Global Health, an institution which had been founded to coordinate international activities of Primary Health Care after 1978, when the World Bank succeeded in shifting the *Health for All* approach of the Alma-Ata conference from a political strategy aimed at increasing economic equality to technical programmes of oral rehydration, breastfeeding and immunisation.<sup>82</sup> A similar strategy to define the issue as a technical problem appeared underway with regard to RTIs.

<sup>80</sup> Dahl, *op. cit.* (note 51), A631.

<sup>81</sup> O. Duperrex and F. Roberts I, 'Safety Education of Pedestrians for Injury Prevention: A Systematic Review of Randomised Controlled Trials', *BMJ*, 324 (2002), 1129–31.

<sup>82</sup> Brown, *et al.*, *op. cit.* (note 63), 62–72; Koivusalo and Ollila, *op. cit.* (note 63), 120–2.

However, even this met little response in the car industry, as the European Enhanced Vehicle Safety Committee (EEVC) realised. Its proposals regarding changes to the fronts of vehicles designed to make them less dangerous to pedestrians were not on the agenda of car manufacturers in 2002.<sup>83</sup>

### The Competition of Development Concepts

At the end of the twentieth century, discussions on RTIs evolved into a more fundamental debate about global development. It was stimulated by the introduction of the Kuznets curve into RTI research. The Kuznets curve went back to a theory presented by Simon Kuznets in 1955. Drawing on historical data of industrialised countries he maintained that social inequality increased in the early phase of modernisation but decreased from a turning point onward as national income continued to grow. The relation between social inequality and economic growth evolved, therefore, along a curve the shape of an inverted U.<sup>84</sup> In the 1990s, the model received a second life as a description of the relationship between economic growth and some pollutants, notably SO<sub>2</sub> and smoke, and became known as the environmental Kuznets curve. This finding provided a welcome defence against accusations that the existing growth-oriented economic system was responsible for large-scale environmental destruction, and it was readily accepted by advocates of the contemporary economic system. In 1992, the World Bank incorporated it into its World Development Report on the environment.<sup>85</sup> In the following years, further research challenged the curve: similar developments could not be reproduced for other forms of environmental burden. Besides, it was doubtful to what extent the effect resulted from the transfer of polluting industries to low-income countries, a strategy which could obviously not be imitated on a global scale.<sup>86</sup> In 2000, van Beeck *et al.* appear to have been the first to observe a Kuznets curve of RTIs in relation to 'prosperity levels'. Economic growth, they argued, was 'not only associated with growing numbers of motor vehicles in the population, but also seems to stimulate adaptation mechanisms, such as improvements in the traffic infrastructure and trauma care'.<sup>87</sup> This view suggested that economic growth would in itself lead to a reduction of RTIs, making a rise in gross domestic product (GDP) the best strategy to reduce the health burden of widespread motorisation. It also implied that RTIs as a health problem were largely solved in high-income countries.

This view was taken up by the World Bank. In 2003, the World Bank Development Research Group on Infrastructure and Environment issued a Policy Research Working Paper on *Traffic Fatalities and Economic Growth*.<sup>88</sup> Analysing vehicles per person (V/P) and fatalities per vehicle (FN) data from eighty-eight countries for the period 1963–99,

<sup>83</sup> J.R. Crandall, K.S. Bhalla and N.J. Madely, 'Designing Road Vehicles for Pedestrian Protection', *BMJ*, 324 (2002), 1145–8.

<sup>84</sup> Simon Kuznets, 'Economic Growth and Income Inequality', *American Economic Review*, 45 (1955), 1–28.

<sup>85</sup> World Bank, *World Development Report* (New York: Oxford University Press, 1992), 41.

<sup>86</sup> For discussions of the Kuznets curve see Sigrid Stagl, 'Delinking Economic Growth from Environmental Degradation? A Literature Survey on the Environmental Kuznets Curve Hypothesis', *Working Paper No.6 in Series of the Research Focus Growth and Employment in Europe: Sustainability and Competitiveness*, Wirtschaftsuniversität Wien, August 1999; Soumyananda Dinda, 'Environmental Kuznets Curve Hypothesis: A Survey', *Ecological Economics*, 49 (2004), 431–55.

<sup>87</sup> Eduard van Beeck, Gerard Borsboom and Johan Mackenbach, 'Economic Development and Traffic Accident Mortality in the Industrialised World, 1962–1990', *International Journal of Epidemiology*, 29, 3 (2000), 503–9.

<sup>88</sup> Elizabeth Kopits and Maureen Cropper, 'Traffic Fatalities and Economic Growth', *Policy Research Working Paper* 3035, April 2003, <http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2003/05/23/000094946.03051404103341/Rendered/PDF/multi0page.pdf> (accessed 3 October 2011).

they found a confirmation of the Kuznets curve with a turning point at a per capita GNP of \$8600 in 1985 international dollars. On the basis of these data and of prognoses of population and income growths, they projected that it would take many years for developing countries to achieve the low RTI fatality rate of existing high-income countries. RTIs in India, for instance, which had a per capita income of only \$2900 in 2000, would only begin to decline in 2042 after a peak of at least twenty-four fatalities per 100 000 persons, or thirty-four when adjusted for estimated underreporting. Brazil would 'already' peak in 2032 and would experience an RTI mortality rate of twenty-six deaths per 100 000 persons as late as 2050, compared to a rate of around eleven enjoyed by high-income countries in 2000. Only on the last page did the text mention, almost in passing, that these projections were based on a continuity of ongoing policies, while measures such as mandatory helmet wearing or effective traffic separation might lower those numbers.<sup>89</sup>

Predictably, the paper provoked different reactions among researchers. Its projections led Nitin Garg and Adnan Hyder to urge that countries like India should take active steps to curb RTIs along WHO recommendations well before the theoretical economic threshold.<sup>90</sup> Other researchers accepted and confirmed a Kuznets curve behaviour of RTIs as the statistical representation of a development whereby increasing national income would allow investments in safer roads and vehicles.<sup>91</sup> In an analysis of data from forty-one countries from the years 1992–6 David Bishai *et al.* found that in low-income countries a ten per cent increase in GDP increased RTIs by 4.7% and RTI deaths by 3.1%. By contrast, GDP increases in high-income countries reduced the number of deaths, although not of crashes or injuries. The turning point appeared to be between \$1500 and \$8000 per capita income.<sup>92</sup> Other projects were more clearly tied to corporate interests. In a study that was financially supported by the automobile industry, Walter McManus of the University of Michigan Transportation Research Institute calculated the lives that would be saved by lowering either vehicles per capita or the fatalities by vehicle. Both would save lives but, he concluded: 'Reducing motorisation (vehicles per capita) is unlikely to be used as a policy to reduce fatalities because it is inextricably linked to economic growth. Consequently, the focus should be on reducing fatalities per vehicle.'<sup>93</sup> Clearly, this approach limited anti-RTI strategies to those not harmful to the large sector of the global economy which depended in some way on the construction or use of motorised vehicles. It also portrayed RTIs as a regrettable but temporary side-effect of modernisation.

However, new approaches to the problem emerged. One sign of changing attitudes appeared in a debate about terminology. In 1987, a group of intensive care specialists in New Zealand proposed to change 'the discourse on road traffic injuries by rejecting the concept of "accidents..."'.<sup>94</sup> In a widely publicised campaign they succeeded in changing the choice of words in the media. Soon, the debate spread to Europe. In 1993, the editor

<sup>89</sup> *Ibid.*, 31–2.

<sup>90</sup> Nitin Garg and Adnan Hyder, 'Exploring the Relationship between Development and Road Traffic Injuries: A Case Study from India', *European Journal of Public Health*, 16, 5 (2006), 487–91.

<sup>91</sup> T. Bishai and Y.-T. Kung, 'Macroeconomics', in S. Galea (ed.), *Macrosocial Determinants of Population Health* (New York: Springer, 2007), 169–91.

<sup>92</sup> David Bishai *et al.*, 'National Road Casualties and Economic Development', *Health Economics*, 15, 1 (2006), 68–81.

<sup>93</sup> Walter McManus, 'The Economics of Road Safety: An International Perspective', *Report No. UMTRI-2007-23*, University of Michigan, October 2007, quote in abstract, <http://deepblue.lib.umich.edu/bitstream/2027.42/61190/1/99864.pdf> (accessed 3 October 2011).

<sup>94</sup> Francesca Racioppi *et al.*, *Preventing Road Traffic Injury: A Public Health Perspective for Europe*, WHO Regional Office for Europe (Copenhagen, WHO, 2004), Box 6.1., 60.

of the prestigious British Medical Journal (BMJ) adopted the same attitude, arguing that numerous injuries, including RTIs, were not accidental and, therefore, should not be called ‘accidents’. Instead, he proposed using ‘crash’.<sup>95</sup> The change of terminology was slow to be accepted. Maybe the expression of ‘traffic accident’ was too deeply ingrained in the general vocabulary, maybe BMJ was insufficiently influential or maybe people were unconvinced by the idea that ‘accident’ should be reserved for those rare events which involved no human responsibility at all. Eight years later, ‘accident’ continued to be widely used, including in articles published by the BMJ. In reaction, BMJ, in its self-proclaimed position as ‘a leading communicator in medicine’ with a responsibility ‘to establish or follow standards in language’ banned the ‘inappropriate use of “accident”’ in its pages.<sup>96</sup>

The change in terminology remained controversial. When the psychologist Alan Stewart (University of Georgia) and social worker Janice Lord, former National Director of *Victim Services of Mothers Against Drunk Driving*, argued against ‘accidents’ since crashes ‘caused by intoxicated, speeding, distracted, or careless drivers’ were no accidents and that such misnaming might create extra stress for crash victims and impede their recovery, several colleagues disagreed.<sup>97</sup> Indeed, prior studies had suggested the opposite effect: patients who blamed themselves for car accidents recovered more rapidly than those who blamed others.<sup>98</sup> Nevertheless, the new terminology was adopted by many researchers and was also in WHO publications. Some authors clearly considered this change an important move, which they took pains to explain.<sup>99</sup> Meanwhile, the current classification of causes of death and disease, ICD-10 kept ‘accident’ and so did other researchers as late as 2012.<sup>100</sup> In fact, the change of words in itself was of limited consequence. It did underscore that RTIs resulted from preventable causes rather than fate and thereby contradicted a view of RTIs as inevitable consequence of development. But the new wording offered no new perspective as long as it continued to refer to well-rehearsed factors such as child restraints or driver behaviour, which stayed well within the conventional discourse.

Other initiatives had more far-reaching consequences. In 1999, Kåre Rumar, professor at the Swedish Road and Transport Research Institute, insisted that, despite falling RTI rates in Europe, the problem was far from solved. To illustrate its continued significance he pointed out that in most European countries one out of three citizens would need hospital treatment after a road traffic accident sometime in their lives and that one in

<sup>95</sup> Ian Evans, ‘Medical Accidents: No Such Thing?’, *BMJ*, 307 (1993), 1438–9.

<sup>96</sup> Ronald Davis, ‘Editorial’, *BMJ*, 322 (2001), 1320–1.

<sup>97</sup> Alan Stewart and Janice Harris Lord, ‘Motor Vehicle Crash versus Accident: A Change in Terminology is Necessary’, *Journal of Traumatic Stress*, 15, 4 (2002), 333–5; Edward Blanchard, Edward Hickling and Eric Kuhn, “‘Crashes” and “Accident””, A Comment on Stewart and Lord’, *Journal of Traumatic Stress*, 16, 5 (2003), 527–8.

<sup>98</sup> Edward Hickling *et al.*, ‘Effects of Attribution of Responsibility of Motor Vehicle Accidents on Severity of PTSD Symptoms, Ways of Coping, and Recovery of Six Months’, *Journal of Traumatic Stress*, 12, 2 (1999), 345–53.

<sup>99</sup> See, e.g., Leonard Evans, *Traffic Safety* (Bloomfield: Science Service Society, 2004, 2nd revised edition 2006), 6; Peden *et al.*, *op. cit.* (note 58), 7.

<sup>100</sup> ICD-10 Version 2010, <http://apps.who.int/classifications/icd10/browse/2010/en#/V01-X59> (accessed 5 October 2012); A.S.M.J. Chowdhury *et al.*, ‘Road Traffic Accidents by “Nasimon” and “Karimon” – A Study in Faridpur Medical College Hospital’, *Faridpur Med. Coll. J.* 7, 1 (2012), 6–9; Ian Roberts, ‘The Truth about Road Traffic Accidents’, *British Journal of Surgery*, 99 (2012), (Suppl 1): 8–9.

twenty people would be killed or injured in a road accident.<sup>101</sup> He urged a systemic approach. In what appeared like an expanded form of the Haddon Matrix he described a web of factors, including age, gender, traffic regulations, road maintenance, attitudes to safety policies, intelligent control systems, unclear distribution of responsibilities, etc. Overall, his explanations aimed at a change of perspective. Instead of accepting the need for motorised traffic as a given and focusing on ways to reduce its health price, intelligent strategies should begin with the underlying purpose of traffic (transportation and mobility) and the biological vulnerability of the human body to external shock, and then search for ways to combine highest benefits with least sacrifice on that basis. As a vastly underestimated measure he singled out reducing the exposure of traffic participants to the risks of motorised transportation:

[T]raffic exposure is increasing faster than the reduction of crash and injury risk. The fact is that presently the number of cars is increasing faster than the number of persons on this planet.<sup>102</sup>

This approach was taken up by the WHO, which was initiating a five-year-strategy.<sup>103</sup> A first result was a study on the ‘Global road safety crisis’, issued in 2003, which incorporated input from various UN bodies. The report advocated integrating RTI consideration into a broader vision of urban development and transportation planning, which also included alternative modes of transport. A one-sided concentration on a car-based system of traffic was portrayed as aggravating social inequality since it invested ‘increasing resources in the building and maintenance of an infrastructure for private motorised transport, while overlooking the public transport needs of the larger part of the population’.<sup>104</sup> It also contributed to further health problems since in ‘many high-income countries, increasing use of cars has led to a general decline in walking and an increase in sedentary lifestyles, which in turn has had adverse consequences in terms of increasing obesity and cardiovascular health problems’.<sup>105</sup> Effective strategies to reduce RTIs were said to require a ‘systems approach’, aimed at identifying and addressing all relevant factors. Successful strategies of high-income countries could serve as orientation, but policies in low-income countries would have to be adapted or even newly created according to local circumstances. While these explanations promised a new approach, the list of relevant determinants (speeding, alcohol, helmets, safety devices, trauma care, road safety standards, traffic safety regulations, vehicle safety) appeared remarkably conventional and addressed, again, to a large extent the behaviour of road users.<sup>106</sup> Nevertheless, the text appears to have been the first time that a high-level international report on RTIs welcomed – and by implication recommended – a cutback of the use of cars as one strategy to reduce the RTI burden.

The concept of a ‘systems approach’ was further elaborated in a *World Report on Road Traffic Injury Prevention*, a WHO report, published in 2004 in collaboration with the World Bank, which presented a wealth of data and analysis. Despite a reality of more

<sup>101</sup> Kåre Rumar, ‘Transport Safety Visions, Targets and Strategies: Beyond 2000’, *European Transport Safety Lecture, European Transport Safety Council*, 26th January 1999 Brussels, <http://etsc.eu/documents/etsl1.pdf> (accessed 5 October 2012), 17.

<sup>102</sup> *Ibid.*, 21.

<sup>103</sup> WHO, *A 5-year WHO Strategy for Road Traffic Injury Prevention* (Geneva: WHO, 2001).

<sup>104</sup> Report of the Secretary-General, Global Road Safety Crisis, A/58/228, Fifty-eighth Session of UNGA, 7 August 2003, 4, [http://www.unece.org/fileadmin/DAM/trans/roadsafe/docs/SG\\_report\\_e.pdf](http://www.unece.org/fileadmin/DAM/trans/roadsafe/docs/SG_report_e.pdf) (accessed 30 September 2011).

<sup>105</sup> *Ibid.*, 4.

<sup>106</sup> *Ibid.*, 7–11.

than 1.2 million RTI deaths, twenty to fifty million people injured and rising numbers the report insisted that RTIs had to 'be considered alongside heart disease, cancer and stroke as a preventable public health problem' which responded 'well to targeted interventions'.<sup>107</sup> The report recommended and discussed in considerable detail a series of well-known practical measures such as speed control, the use of seat-belts and adequate child restraints as well as helmets for two-wheeler users, the enforcement of alcohol limits, good road design, improved vehicle standards and efficient post-crash medical care. These were only presented, however, as pieces of a much larger puzzle. Other, less frequently cited but relevant strategies included reducing the deprivation of underprivileged social groups, the separation of different types of traffic in clearly marked separate roads with different speed limits, mandatory daytime running lights, intelligent seat-belt reminders, traffic calming measures such roundabouts, road narrowings, chicanes or road humps, or crash-protective roadsides.<sup>108</sup> And even these points were merely tactical elements in a far more comprehensive approach, designed not primarily to make motorised traffic safer but to provide living conditions which would satisfy human needs for food, household items, work and leisure activities in intelligent ways.

This task might entail measures to reduce the need for travel by '[l]and-use planning practices and "smart growth" land-use policies – development of high-density, compact buildings with easily accessible services and amenities' or the 'creation of clustered, mixed-use community services' or encouraging the use of electronic mail for communication.<sup>109</sup> If moving from one place to another could not be totally prevented, it could be organised in safer ways than through private cars. Calculations for the European Union regarding the risk of death in relation to distances travelled listed motorised two-wheeler users as running twenty times the risk of car occupants, who were seven to nine times safer than cyclists or pedestrians but ten times less safe than bus and train occupants. Thus, travelling by public transportation was by far the safest means of transportation, creating good reason to encourage it.<sup>110</sup> Reducing the need to travel in general and to travel by car in particular was also considered a very positive step since, as studies from high-income countries indicated that 'under certain conditions, for each 1% reduction in motor vehicle distance travelled' there was 'a corresponding 1.4–1.8% reduction in the incidence of crashes'.<sup>111</sup> Besides, such measures could have tangible health benefits in addition to reducing RTIs, such as increasing healthier life-styles through more walking and cycling, and reducing noise and air pollution.<sup>112</sup>

However, as the report acknowledged, many of the road safety measures would not be applicable in developing countries, where the need to act was greatest. Since the large majority of global RTI victims were pedestrians and cyclists in low- and middle-income countries and since in the foreseeable future most people in those countries would continue to be walking, cycling and using public transportation, their needs would have

<sup>107</sup> Peden *et al.*, *op. cit.* (note 58), 109.

<sup>108</sup> Peden *et al.*, *op. cit.* (note 58), 94–5, 111, 116–7, 125.

<sup>109</sup> Peden *et al.*, *op. cit.* (note 58), 110.

<sup>110</sup> Statistics, Peden *et al.*, *op. cit.* (note 58), 75. Proposed measures included better management, restrictions on vehicle parking and road use, better coordination between different types of travel via schedules and tariff schemes, park and ride facilities, shorter distances between stops and improved attractiveness of vehicles and waiting areas, financial incentives as well as higher fuel taxes. Peden *et al.*, *op. cit.* (note 58), 111.

<sup>111</sup> Peden *et al.*, *op. cit.* (note 58), 110.

<sup>112</sup> Peden *et al.*, *op. cit.* (note 58), 158.

to be the priority concern.<sup>113</sup> In the absence of facilities for pedestrian and cyclists many people were forced to travel with privately run services. These services, often in obsolete overloaded vehicles, driven by overworked drivers and owned by businessmen, who bribed traffic enforcement authorities, created substantial risks to occupants as well as other traffic participants. Among other measures, strategies had to be found that would simultaneously address the ‘safety of road users, the labour rights of drivers and the economic interests of the vehicle owners’.<sup>114</sup> Such a traffic pattern with its mix of dangerous motorised vehicles sharing road space with large numbers of vulnerable road users had never been experienced by high-income countries and therefore lessons from North America and Europe were of only limited use in the rest of the world.<sup>115</sup> In addition, the report showed a more complex connection between RTIs and development by citing estimated global costs of the RTI burden of US\$518 billion per annum and \$100 billion in developing countries ‘twice the annual amount of development assistance to developing countries’.<sup>116</sup> In this perspective, RTIs did not appear as a temporary price paid for a generally beneficial economic development but as a powerful impediment to development.

This WHO report was the most detailed study on RTIs as a global health problem to that date, and was meant to become the central reference point for further research. Its wealth of information made it a publication which was impossible to ignore. Notably its numbers regarding present and estimated future RTI victims became the standard components of virtually all following studies. The system’s approach included near-revolutionary elements. Questioning the connection between motorised transport and modern economic development by decentralising residential areas or by making use of online communication means challenged the logic of the traditional view of development, more so than the various traffic reduction measures begun in OECD urban areas during the 1970s. While pedestrian zones restricted traffic locally, adopting a reduction of the need to travel as a goal of intelligent housing and work plans could potentially change the concept of development as people knew it.

The structure of recommendations underlined the comprehensive nature of the report, listing what governments, policy, legislation and enforcement, the public, vehicle manufacturers, donors, communities, civil society groups and individuals could do. Clearly, preventing or reducing RTIs was considered everybody’s responsibility. However, the very comprehensiveness of the report obscured its radical components in the midst of a multitude of more conventional ideas. Indeed, the large number of recommended measures allowed adopting a broad approach that nevertheless could leave out individual onerous ideas. In the summary, only two recommendations out of forty-seven called for the establishment of public transportation and none explicitly mentioned the inclusion of traffic-reduction objectives in land use plans.<sup>117</sup>

The UN instituted the United Nations Road Safety Collaboration, designed to implement the recommendations of the *World Report*. The group consisted of regional and global international organisations, including the World Bank and UNICEF, and a variety of other national and international bodies (governments, non-governmental organisations, donors, research agencies and the private sector) where the WHO held a coordinating role.

<sup>113</sup> Peden *et al.*, *op. cit.* (note 58), 73, 121, 143.

<sup>114</sup> Peden *et al.*, *op. cit.* (note 58), 111.

<sup>115</sup> Peden *et al.*, *op. cit.* (note 58), 42.

<sup>116</sup> Report of the Secretary-General, *op. cit.* (note 104), 4.

<sup>117</sup> Peden *et al.*, *op. cit.* (note 58), Box 5.1, 159–60.

This strand has also led the UN General Assembly in March 2010 to proclaim the period 2011–20 as the *Decade of Action for Road Safety*.<sup>118</sup> Thus, there has been a real effort on the part of the UN to construct RTIs as a global issue and to assume responsibility for it.

Other organisations reacted with their own reports. Each referred to the 2004 *World Report*, and provided its own interpretation in line with its own outlook. In subtle ways, they carried out a competition of concepts: one designed to safeguard motorised transport by making it safer through technical, legal and administrative modifications, another designed to modify the entire system of transport by questioning the prioritisation of its motorised form. A report by WHO Europe, which also came out in 2004, was among the latter. It emphasised the synergistic value of various anti-RTI measures and the environmental component of overall anti-RTI policies. In the process, it portrayed finding ways to reduce RTIs as part of a strategy for sustainable development:

A sustainable transport system is one that (i) provides for safe, economically viable and socially acceptable access to people, places, goods and services; (ii) meets generally accepted objectives for health and environmental quality . . . ; (iii) protects ecosystems by avoiding exceedance of critical loads and levels for ecosystems integrity . . . and (iv) does not aggravate adverse global phenomena, including climate change, stratospheric ozone depletion, and the spread of persistent organic pollutants.<sup>119</sup>

The same objective of ‘sustainable development’ was echoed in the title of *Make Roads Safe: A New Priority for Sustainable Development*, published by the Commission for Global Road Safety in 2006. The Commission was created by the FIA Foundation for the Automobile and Society in 2005 with former NATO Secretary-General Lord Robertson as chairman. Its advisory board included prominent people connected with the automobile sector, but also members of the WHO, the World Bank and the OECD.<sup>120</sup> The campaign ‘Make roads safe’ has been supported by a number of celebrities and world leaders such as British Prime Minister Tony Blair and Archbishop Desmond Tutu.<sup>121</sup> The Commission also supported the GRSP created by the World Bank in 1999. Cooperation and overlap of personnel and website space with the GRSP was such that it was questionable to what extent these were distinct bodies. The GRSP website included a link from which the 2004 *World Report on Road Traffic Injury Prevention* could be downloaded and it issued guidelines for the implementation of its recommendations.<sup>122</sup>

However, below the surface of agreement to behavioural, technological and administrative changes, underlying differences about where transport policies in particular and socio-economic development in general should be heading were played out. *Make Roads Safe: A New Priority for Sustainable Development* focused attention on road improvements while referring to developmental challenges.<sup>123</sup> The report argued that low-income countries could and should learn from the experiences of high-income countries

<sup>118</sup> Note by the Secretary-General, Improving Global Road Safety, A/62/257, 14 August 2007, <http://www.uneca.org/fileadmin/DAM/trans/roadsafe/docs/A-RES-62-257e.pdf> (accessed 5 October 2012).

<sup>119</sup> Francesca Racioppi *et al.*, *Preventing Road Traffic Injury: A Public Health Perspective for Europe*, WHO Regional Office for Europe (Copenhagen: WHO, 2004), 33.

<sup>120</sup> <http://www.makeroadssafe.org/about/commissionforglobalroadsafety/Pages/homepage.aspx> (accessed 5 October 2012).

<sup>121</sup> Note by the Secretary-General, *op. cit.* (note 118).

<sup>122</sup> Tony Bliss and Jeanne Breen, *Country Guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects. Implementing the Recommendations of the World Report on Road Traffic Injury Prevention* (Washington, DC: The World Bank Global Road Safety Facility, 2009).

<sup>123</sup> Commission for Global Road Safety, *Make Roads Safe: A New Priority for Sustainable Development*, 2006, [http://www.makeroadssafe.org/publications/Documents/mrs\\_report\\_2007.pdf](http://www.makeroadssafe.org/publications/Documents/mrs_report_2007.pdf) (accessed 5 October 2012).



but without having to imitate every step. Instead of repeating the Kuznets curve relation between economic growth and RTIs, found in Europe and North America in the 1960s, low-income countries should use additional measures as a form of shortcut to lower RTIs.<sup>124</sup> Rather than aiming at a ‘system’s approach’, like the 2004 *World Report*, the Commission proposed a ‘safety system’s approach’, which recalled the Haddon Matrix of 1968. This combination of pre-crash, crash and post-crash measures for people, vehicle and environment made the approach appear comprehensive, while accepting motorised transport as a given and narrowing ‘environment’ to the technical qualities of a road: its design, markings, maintenance, protection, pedestrians’ crossing and rescue facilities.<sup>125</sup> Improving the safety of vehicles held little promise in low-income countries, the report argued, since few people could afford modern cars and the variety of vehicles used prevented a quick effect. Ruling out an emphasis on people as a way of ‘blaming the victim’ the report focused on roads as central elements. This strategy was not limited to low-income countries since, ‘[a]mongst the best performing industrialised nations, improved road infrastructure remains the major source of expected future contributions to casualty reduction targets.’<sup>126</sup> Nevertheless, the development of low-income countries, formed a central argument using the Millennium Development Goals (MDGs) as points of reference. The report criticised the MDGs for ignoring RTIs and insisted on the central importance of roads for achieving these goals in a long-term, ‘sustainable’ manner.<sup>127</sup> Thus, according to the report, the aim could not be development without roads but development with lots of roads of good quality. A central recommendations, therefore, was that ‘at a minimum 10% of all road infrastructure projects should be committed to road safety and that this principle should be rigorously and consistently applied by all bilateral and multilateral donors’.<sup>128</sup> Thereby, the report reconfigured RTIs from a development to a development-assistance-programme issue.

Three years later, the WHO issued a *Global Status Report on Road Safety*, which sought to provide an overview over the state of RTI related conditions in all countries worldwide. Based mainly on information gathered in a questionnaire, the report addressed a broad range of factors: institutional settings, the quality of data, vehicle and infrastructure standards, legislation on some of the main behavioural risk factors, medical care and exposure to risk. While the behavioural factors (speeding, drink-driving, use of motorcycle helmets, use of seat-belts and child restraints) received relatively most attention in terms of pages, the exposure to the risk, defined as ‘the existence of policies to encourage non-motorised modes of transport and public transport and strategies to achieve these, and levels of motorization’ were also addressed and related questions were included in the questionnaire.<sup>129</sup> The results reflected years of prioritising transport by car: forty-four per cent of all countries worldwide had no policy, national or local, that encouraged public transport, and sixty-eight per cent had no policy that encouraged walking or cycling as an alternative to motorised transport. In an obvious attempt to produce an inspiring model, the report presented positive examples from Bogotá, Sweden, Delhi and Lagos, where policies of this type had tangibly reduced RTI numbers.<sup>130</sup> In addition, the need for such

<sup>124</sup> *Ibid.*, 18.

<sup>125</sup> *Ibid.*, 12–13.

<sup>126</sup> *Ibid.*, 15.

<sup>127</sup> *Ibid.*, 4, 46.

<sup>128</sup> *Ibid.*, 3.

<sup>129</sup> WHO, *Global Status Report on Road Safety. Time for Action* (Geneva: WHO, 2009), 9 and x.

<sup>130</sup> *Ibid.*, 16–18.

policies was addressed in the first of five central recommendations, although it was framed as an issue of ‘road design and infrastructure, land use planning and transport services’, understating its systemic nature.<sup>131</sup>

The World Bank had cooperated with both the Commission for Global Road Safety and with the WHO, and in many ways its position has been the most interesting and possibly the most important, given its financial clout and its influential voice in the development debate. A 2007 report, issued by the in-house Independent Evaluation Group of the World Bank, painted the picture of an institution in search of a position regarding a rapidly evolving issue. The report spelled out the stakes involved: an expected ‘huge expansion’ of the global automobile market, based on the motorisation of China and India, which predicted that ‘over the next 20 years, more cars may be built than in the 110-year history of the industry’.<sup>132</sup> Clearly, decisions in this issue involved lots of money, and a huge private market, in which the Bank and its investors could hardly remain disinterested, especially since those two countries had absorbed almost half of all World Bank lending in the transport sector since 2000.<sup>133</sup> However, the Evaluation Group also recognised that the pressure of a three per cent annual growth rate of cars on global roads increasingly created environmental and health problems – and thereby eventually economic burdens.<sup>134</sup> Times were changing and the Bank risked becoming outdated unless it changed, too. The report regarded the dominance of road building in the present World Bank transport portfolio as a threat to its long-term relevance. While highway construction would remain important, other ‘transport modes and themes’ were also becoming significant and it was ‘essential to see transport opportunities with a multimodal setting of integrated urban and rural concerns’.<sup>135</sup> Given the importance of the ‘poor in urban and rural areas of developing countries’ and the bad condition of non-motorised transport facilities open to them, which had been neglected, including by World Bank activities, the report strongly recommended that the Bank begin funding related projects despite ‘the lack of or very low revenue-generation nature of such projects’.<sup>136</sup> After all, holistic road safety approaches were increasingly being pursued ‘in all regions’.<sup>137</sup> Presumably, the World Bank would be well advised to recognise these tendencies, their demands and opportunities at an early stage. In other words:

[P]ast Bank experience, with its relatively narrow, albeit successful, primary focus on roads, will be insufficient to provide for the Bank’s future response to these emerging challenges. . . . Overall, the sector is at a crossroads, where it has a good window of opportunity to attain a higher level of relevance and offer a better level of support to its clients.<sup>138</sup>

## Conclusions

In 2012, the history of RTIs as part of the development discourse is far from finished. The upcoming years and decades will clearly bring changes in the number of RTI deaths, in RTI discussions and in their perceived relation to development. All stakeholders will be able to choose from a broad range of approaches which have been endorsed by different

<sup>131</sup> *Ibid.*, 39.

<sup>132</sup> World Bank Independent Evaluation Group, *A Decade of Action in Transport. An Evaluation of World Bank Assistance in the Transport Sector, 1995–2005* (Washington, DC: World Bank, 2007), xiii.

<sup>133</sup> *Ibid.*, 23.

<sup>134</sup> *Ibid.*, 25.

<sup>135</sup> *Ibid.*, xvii.

<sup>136</sup> *Ibid.*, xxix.

<sup>137</sup> *Ibid.*, 79.

<sup>138</sup> *Ibid.*, xviii.

Factors	Elements	Strategies of RTI reduction	Responsible	Interpretive framework
People behaviour	Drivers of motor vehicles bicycle riders, passengers, pedestrians	Adapt behaviour (alcohol, speeding, distraction, helmet, traffic education)	Traffic participants; legislatures; police	Legal, psychological
Vehicles	Cars, buses, trucks, motor-bikes, bicycles	Highlight safety during production	Industry; legislatures	Technological; legal
Roads	Size, surface, markings, signs and maintenance	Provide safe driving environment	Administration	Technological
Medical Care	Ambulances, hospitals, staff trained in RTI treatment	Create and maintain adequate medical care	Medical services	Administrative
Organisation:	Existence and enforcement of regulations	Create and enforce regulations	Legislatures; police	Legal, administrative
Institution	Agency with clear mandate, budget and programme in charge of RTI prevention	Centralise and coordinate all RTI-related knowledge and initiatives	Government	Political (national)
Non-motorised transport	Pedestrian areas, cycle paths, public transportation	Build infrastructure for non-motorised and public transport; separate road users	Administration; private enterprise	Political (local and national), economic
System	Communication with work place; location of shops and places of leisure and social activities	Modify living and working conditions so as to reduce mobility needs	Government, society	Systemic, societal

Table 2: Matrix of RTI constructions.

Period	Transport development: events	RTIs: events	Publications	RTIs: discourse: prioritised factors (Table 5)	Transport development: discourse
1900–45	Motorised vehicles spread mostly in USA; highway building programmes in USA (1916) and Germany and Italy (1930s)	RTI mortality in USA rise from 7/100 000 (1910s) to over 29/100 000 (1930s); GB: rise to 18/100 000 (1939); collisions mostly involve only one motorised vehicle		People's behaviour	Road turns from space for pedestrians to space for cars; modernisation in high-income countries = motorisation
1945–70	Motorised vehicles spread in Europe	More people die of RTIs than of major epidemic diseases in HICs; most collisions involve several motorised vehicles in HICs	1962 WHO: <i>Road Traffic Accidents</i>  Ralph Nader: <i>Unsafe at any Speed</i> (1962)	People's behaviour; Organisation	RTIs = serious public health concern but also a necessary price for modernisation
1970–98	Urbanisation in LICs and MICs; large-scale investment in road building	Measures to reduce motorised traffic in HIC cities; decline of RTI deaths in HICs, dramatic increase of RTI deaths in MICs and on global scale, involving predominantly one motorised vehicle and other traffic participants	1968: William Haddon Jr, 'The Changing Approach to the Epidemiology'	Vehicles  People's behaviour; vehicles; roads  Organisation	RTIs result from safety-neglecting (underdeveloped) car designs (blame: manufacturers)  systemic approach to crashes  Doubts about growth-oriented economic system in HICs (1970s), rise of neoliberalism (1980s); debate about 'sustainable development'; excessive car traffic is considered a burden on urban life in HICs

Table 3: (Continued on next page)

Period	Transport development: events	RTIs: events	Publications	RTIs: discourse: prioritised factors (Table 5)	Transport development: discourse
1999–today			1994 World Bank World Development Report	Organisation	Cost-effective transport is essential for development; RTIs are a secondary concern
			1996: World Bank/WHO: Global Burden of Disease Project	Medical care	RTIs = major burden on global health and development, especially in MICs
			1998: Red Cross: World Disaster Report/Global Road Safety Partnership	People's behaviour	
			2003: World Bank: 'Traffic Fatalities and Economic Growth'	Economic growth is essential to reduce RTI rate (Kuznets curve)	
			2004: WHO/World Bank: <i>World Report on Road Traffic Injury Prevention</i>	Institution; people's behaviour; non-motorised transport; system	Development should serve (transport) health, not <i>vice versa</i> .
			2006: Commission for Global Road Safety: <i>Make Roads Safe</i>	Roads	Good roads are essential to development and to RTI reduction
			2007 World Bank: <i>Global Status Report on Road Safety</i>	Organisation; non-motorised transport	

Table 3: Matrix of events-discourse correlation. Abbreviations: HIC – high-income country; MIC – middle-income country; LJC – low-income country; NMT – non-motorised traffic.

actors at different times in the twentieth century (Tables 2 and 3). This paper identifies eight approaches each involving different elements, RTI reduction strategies, responsible agents and interpretive frameworks. While addressing the behaviour of traffic participants has been the preferred approach, all the others have been chosen as well at some point or another, depending on world views and interests. Implicitly and, increasingly, explicitly development played an important role in these choices.

From the beginning, RTIs have formed part of the spread of motorised traffic. First in North America and then in Europe, rising numbers of cars lead to a rising number of RTIs, which caused concern. In the 1970s, RTIs numbers were brought to an acceptable – or accepted – level by a combination of regulations, affecting a broad range of traffic components, and by some measures, which upgraded non-motorised relative to motorised traffic in urban areas. After the 1970s, the number of cars rose in other parts of the world, causing an increase in RTIs in those countries as well. By 2000, the RTI situation was recognised as critical.

This paper argues that current difficulties arise in part from a selected transfer of development models, derived from pre-1945 high-income countries to post-1945 low-income societies. In order to be less lethal, the transfer of individualised motorised transport as the principal transport model would have required a physical, legal and administrative infrastructure, which low-income countries clearly did not have. On a large scale, the process was similar to the policy of the baby food companies in the 1970s when they sold infant formula to people in low-income countries who did not have a reliable infrastructure of clean water and sterilisation technology necessary for a safe administration of formula.<sup>139</sup> Although the export of motorised transport is more complex than that of baby formula the underlying logic is comparable: a mixture of profit-driven interests, a Eurocentric view of ‘modernisation’ and ‘development’, and a lack of infrastructure such as helmets, speed limit regulations, police enforcement, modern cars, road maintenance, etc. In both cases, further policies depend on the extent to which the health discourse can affect the underlying development discourse.

So far, RTIs have been recognised as an important element of the larger transport/development discourse, but a number of factors prevent their prioritisation:

- The economic interests of stake-holders of motorised traffic, above all the automobile industry;
- The traditional conception of ‘modernity’ as motorisation, deeply ingrained in the collective consciousness in high- as well as in low-income countries;
- The path dependency of existing material infrastructures, which privileges motorised vehicles and, on the other side, the scarcity or absence of a material infrastructure for safer modes of travelling, especially in low-income countries;
- The class difference separating the car drivers and the non-drivers in low-income countries and thereby those who are most like to survive collisions unharmed and those who are most likely to die. This difference also effectively excludes the potential victims, who would benefit most from policy changes, from political decision-making processes in their countries.<sup>140</sup>

<sup>139</sup> J. Dobbing, *Infant Feeding. Anatomy of a Controversy 1973–1984* (London: Springer, 1988).

<sup>140</sup> Interestingly, the gender component, which should have worked the other way, does not appear to have had any effect. Men have a clear majority both among RTI victims and among decision makers but this does not seem to have affected the discussions on road safety. Maybe class beats gender as an influential factor, or there is too little awareness of the pronounced male dominance among RTI victims.

- The deceptive assurance of a Kuznets curve like concept that promises a solution of the specific problems of low-income countries once they cease to be low income.
- The sheer extent of reconceptualisation necessary to separate motorisation from economic development.

It seems that it is the idea of development as ‘catching up’, of imitating step by step the development taken in high-income countries, which most stands in the way of novel systemic approaches. This concept ignores the fact that it is not possible to extend the car density, the level of fossil fuel consumption and the culture of suburban spread of Europe and North America to the rest of the world. On the basis of present-day knowledge about the physical state of our planet, a global repetition of the motorisation experience in high-income countries is simply not possible and is therefore not a useful development model. Nor is it necessary for an intelligent modernisation. The mobile phone is one example that a modern means of communication can be extended globally without spreading its Europe-centred predecessor (in this case networks of landline cables) first. There is no reason to assume nothing similar could happen in the field of mobility and transportation, given the political will and economic prospects.

Promoting non-motorised transport would reduce RTIs in high-income countries and even more so in low-income countries. Since, by broad consensus, development in high- as well as low-income countries is meant to improve public health, the need to reduce RTIs may eventually serve as a powerful argument to search for intelligent transport solutions.

For this argument to become effective, it must be made convincingly – so discourse is important – and it must be heard. In this context, the promotion of a medical doctor with a history of health promotion in low-income countries to the post of World Bank Director is an interesting development.