



Research report nr. 2017-R-15-EN

My Life After the Crash - MyLAC

An international study on medical, psycho-social and economic consequences of road injuries



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Table of content

Acknowledgements	4
Multilingual summaries	5
1. Introduction	17
1.1. General context.....	17
1.2. Dimensions considered in the report	17
2. Study design and methodology	20
2.1. Survey preparation and dissemination.....	20
2.2. Topics and instruments included in the survey	23
2.3. Participants included in the study.....	24
2.4. Data Analysis	27
3. Main Results.....	29
3.1. Results for the total sample.....	29
3.1.1. Circumstances of the crash.....	29
3.1.2. Justice proceedings and insurance claims	30
3.1.3. Medical consequences.....	31
3.1.4. Psychological consequences	33
3.1.5. Impact on day-to-day, socio-emotional and family life.....	33
3.1.6. Professional and economic consequences.....	35
3.2. Results for some specific regions	37
3.2.1. Introduction	37
3.2.2. Circumstances of the crash.....	39
3.2.3. Justice proceedings and insurance claims	40
3.2.4. Psychological consequences	41
3.2.5. Public health.....	42
3.2.6. Impact on day-to-day, socio-emotional and family life.....	43
3.2.7. Professional and economic consequences.....	44
4. Conclusion.....	46
4.1. Overall findings.....	46
4.2. Cross-region comparisons	47
4.3. Limitations of the study	48
4.4. General discussion.....	49
4.5. Recommendations.....	50
List of tables and figures.....	53
Tables.....	53
Figures	53
References	55
Appendix: Comparisons of the study variables between specific countries/regions	59

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¹ The last translation, into Czech language, was managed by a freelance professional translator.

Multilingual summaries

Executive summary

Goal and methodology

Mortality is often considered as the primary indicator of the scale of a health problem. This also applies to road traffic injuries. However, in order to fully consider and understand the human impact, it is important to take into account non-fatal outcomes.

This is particularly true in the context of road safety, since most road crashes lead to injuries, many of which have a lasting impact. Road crashes are responsible for many serious injuries, globally estimated at 20 times more than deaths (World Health Organization, 2009). Road-related injuries can, moreover, have a major impact not only on the quality of life of the survivor of a crash - sometimes to a considerable degree and for a long time - but also on their family and more broadly on society as a whole. Much remains to be done in order to lessen the possible negative impact of traffic crashes on the lives of those directly involved and of their relatives.

The purpose of the MyLAC project - jointly conducted by the Vias institute and by the European Federation of Road Traffic Victims (FEVR) was to gain a better understanding of the range of consequences of road crashes for injured victims. More specifically the purpose was threefold :

- *to develop insight in the range of consequences of injuries caused by traffic crashes ;*
- *to determine the factors that could contribute to a better quality and standard of living for victims ;*
- *to underpin arguments for continued investments in post-crash response and in victims support and assistance as well as in road safety measures in general.*

MyLAC is an international retrospective study that aimed to examine the consequences of road crashes from different points of view, including medical, psychological, social and economic. The survey was translated into 15 languages and disseminated online over a period of 5 months (May to September 2016) by more than 40 organisations (Road Traffic and Patient Assistance Associations) across 20 Member States of the EU. A total of 755 injured victims replied to the questions in the survey.

The MyLAC questionnaire consists of 90 items covering the following dimensions: the circumstances of the crash, the quality and duration of the legal proceedings and the insurance aspects, the medical and psycho-social consequences, the impact on daily life, the personal, family and social life and on the professional and economic situation. An overall analysis on the total sample was made. In addition, comparative analyses were conducted on three subsamples that were considered to be large enough and sufficiently homogeneous and representative of their population, namely : Denmark (N=209), Belgium (N=91) and Western Europe (N=274, including The Netherlands, Germany, Belgium, Luxembourg and France).

Key results

The descriptive analysis of the sample showed that a large proportion of the sample suffered from serious injuries (about 60%) and this was seemingly due to the selection method (i.e. through road victims and/or patient organisations). As for the type of road users, four-wheeler occupants were the most represented (59.1%), followed respectively by powered two-wheelers (16.0%), cyclists (14.6%) and pedestrians (10.3%). Complementary analyses also showed that the sample composition was quite heterogeneous across sub-regions. Respecting that fact, and in order to allow comparisons of results, the main analyses were conducted separately according to the levels of severity and to the types of road users.

More than 70% of respondents stated that no human action on their part was a causal factor in the crash and nearly 80% of them said they were not at fault. In more than 80% of cases, the human behaviour or other human factors of the other road user(s) involved in the crash were considered to be the main causal factor in the crash (inappropriate behaviour and inattention / distraction being the most frequently reported in 49% and 43% of cases, respectively). Non-human factors (e.g. weather conditions, vehicle failure, road/infrastructure conditions) were reported in 4 out of 10 cases.

About half of the victims - among those not at fault - appeared in court. More than 50% of them were not satisfied with the outcome of the procedure, and 66% were not satisfied with its duration - in 40% of the cases, the legal procedures lasted more than three years. Regarding the insurance aspects, one-third of those interviewed stated that they had received no compensation for injuries or moral damages. Unsurprisingly, satisfaction with insurance benefits was also quite low.

Head trauma is the most common injury found with four-wheeled occupants (drivers and passengers combined, approximately 80%) and pedestrians (approximately 60%), followed by spinal injuries for four-wheeled occupants (50%) and by lower extremities injuries for pedestrians (55%). For cyclists and motorcyclists, the most common injuries are unspecified injuries (55% to 75%) followed by injuries to the head (60%) and to lower (50%) and upper extremities

(45% to 50%). Overall, the average number of body regions impacted during the crash was 2.26 and this figure did not differ significantly by mode of transport. The severity, however, was associated with a higher number of affected body regions (3.03 vs. 1.84) and injuries (6.5 vs. 3.5) and a much lower complete recovery rate (about 20% vs. 50%).

The injuries incurred - and in particular their severity - appear to be associated with significant functional losses, particularly in the dimensions of 'activities of daily living', 'pain', 'mobility' and 'self-care'. Functional loss was more important for serious injuries. No significant differences related to the mode of transport were identified.

A large proportion of respondents reported psychological difficulties, the most common of which related to symptoms of post-traumatic stress disorder (approximately 60% of the sample), depression (approximately 55%) and anxiety disorder (approximately 45%). More serious injuries have been associated with increased rates of anxiety and depression (but not post-traumatic stress disorder).

On average, the impact of the crash on daily life, socio-emotional life and family life was assessed by the victims as moderate. Nevertheless, more than a third of the sample reported that the crash had had consequences for at least one of their relatives (for private or professional life). A third of the sample also reported to have adapted their housing or had to move in order to better adapt to their situation of disability or functional limitations. Compared to other road users, cyclists reported more frequently that they did not have to modify / adapt their accommodation because of the crash. More serious injuries have been found to be associated with greater impact on all of these aspects, namely, the victim's daily, socio-emotional and family life, living condition and surroundings.

Nearly three-quarters of the sample said they had to leave work or interrupt their education for a long time or permanently. Overall, the impact of the crash on professional activity is highest for pedestrians: more than 80% report a prolonged or permanent withdrawal from working life (81.8%) compared to around 70% for other road users. The impact on working life was also evident for both serious injuries (85% prolonged or permanent absence) and for lighter injuries; although for the latter the impact is lower, it remains nevertheless substantial (50% of prolonged or definitive absence). Finally, nearly 50% of victims reported a decrease in their monthly income of at least € 200 and about 20% of them a drop of at least € 1,000.

The cross-country/region comparison showed that the consequences of the crash were substantial in each of the observed subsamples (i.e. Denmark, Belgium and Western Europe). However, the Danish subsamples were on average shown to suffer from less drastic consequences than the two others subsamples. In particular, Danish respondents reported less frequently having been considered at fault in the crash and inappropriate human actions in their own side. They also reported a much better efficiency - as compared to the two other subsamples - of the justice and insurance systems and fewer major consequences on their day-to-day, socio-emotional and family life, on their living situation, their professional and financial situation and on the life of their relatives. Finally they also rated the public health resources and facilities provided in their own country as much more efficient than the two other subsamples. Surprisingly, however, they were shown to suffer from more important psychological difficulties, in particular, regarding PTSD and anxiety symptoms.

The respondents in the Belgium subsample showed the worst outcomes for the following dimensions: highest rates of at-fault crashes and of inappropriate human actions on their own side ; lowest efficiency - and satisfaction - of the judicial and insurance systems (both in term of outcomes and of length of proceedings). On the other hand, they scored better in terms of the psychological consequences, in particular for PTSD and anxiety related symptoms. Overall, the Western European subsample showed intermediate results between the Danish and the Belgian subsamples.

Conclusion and discussion

Although the MyLAC study has a number of limitations (e.g. heterogeneity of subsamples between different countries, selection bias through road victims and/or patient associations, retrospective and self-reporting nature of the survey), it nevertheless provides valuable insight into the nature and extent of the consequences for injured road victims and their relatives.

The study results lead to the following recommendations:

- The judicial and insurance systems and procedures should be improved. For example, progress could be made to improve the adequacy - and the level - of compensation with the victim's needs and reality and to simplify and speed up legal procedures. Learning from best practice on these topics seems useful; our results suggest that the procedures in Denmark could be an interesting case to study.
- The accessibility and visibility of victims support organisations and services should be improved, as well as the quality and range of services. Efforts are needed to increase the collaboration between the different stakeholders the injured victims are confronted with (e.g. insurances, justice, health/mental health services, etc.) in order to offer integrated, transdisciplinary and personalised services. In such a perspective, the victims associations or services could operate as a central platform that could help and support the victims - and possibly also their relatives - through all the steps and procedures following the crash, including with assistance for the defence of their rights.
- The efficiency of the post-crash response and support services for victims needs to be improved, since early and appropriate interventions have the potential to substantially reduce some of the deleterious impacts of a traffic crash.

- *Road safety campaigns should also be used to raise peoples' awareness of the long term suffering that results from road traffic crashes. Such awareness building should also be integrated in basic school citizenship education or even in the driving education systems.*

Zusammenfassung (DE)

Ziel und Methode

Die Sterblichkeit (Anzahl der Toten) wird oft als Hauptindikator für eine medizinische Erkrankung oder Epidemie angesehen. Um die Auswirkungen auf den Menschen vollständig zu verstehen, müssen jedoch auch die nicht tödlichen Folgen berücksichtigt werden. Dies gilt insbesondere im Zusammenhang mit der Verkehrssicherheit, da die Folgen von Verkehrsunfällen oft zu Verletzungen führen, von denen viele nachhaltige Auswirkungen haben. Unfälle im Straßenverkehr sind für viele schwere Verletzungen verantwortlich. Man nimmt an, dass deren Zahl 20-mal höher ist als die der Getöteten (Weltgesundheitsorganisation 2009).

Die Verletzungen die im Straßenverkehr entstehen, können nicht nur einen großen Einfluss auf die Lebensqualität des Überlebenden haben (manchmal ist dieser Einfluss sehr bedeutend und zieht sich über einen langen Zeitraum), sondern auch einen großen Einfluss auf die ganze Familie, ja sogar auf die Gesellschaft als Ganzes haben. Es muss noch viel getan werden, um den negativen Einfluss von Unfällen im Straßenverkehr auf das Leben der direkt Beteiligten und deren Umkreis zu verringern.

Der Zweck des MyLAC Projektes, das das Vias Institut zusammen mit der Europäischen Vereinigung der Verkehrsunfallopfer (FEVR) durchgeführt hat, war es, einen besseren Einblick in Natur und Umfang der Folgen von Verkehrsunfällen für die Opfer zu bekommen. Insbesondere wurden hier drei Ziele angestrebt:

- *Einen Einblick in Natur und Umfang der Folgen von Verletzungen im Straßenverkehr zu bekommen;*
- *Faktoren zu bestimmen die zu einer besseren Lebensqualität und einem besseren Lebensstandard für die Opfer beitragen könnten;*
- *und Argumente für Investitionen in der Phase nach dem Unfall zu untermauern, wie z.B. die Unterstützung der Opfer aber auch allgemeinen Verkehrssicherheitsmaßnahmen.*

MyLAC ist eine internationale retrospektive Studie, die die Folgen von Unfällen im Straßenverkehr aus medizinischer, psychologischer, sozialer und wirtschaftlicher Sicht untersucht. Die Umfrage wurde in 15 verschiedene Sprachen ausgeführt und während einer Zeitspanne von 5 Monaten von mehr als 40 Organisationen (Verkehrsunfallopfer und Patientenvertretungen) online in 20 EU Mitgliedsstaaten verbreitet (Mai bis September 2016). Im Ganzen haben 755 Verkehrstopfer an der Befragung teilgenommen.

Der MyLAC Fragebogen bestand aus 90 Punkten/Fragen die folgende Dimensionen berücksichtigten: die Umstände des Unfalls, die Qualität und Dauer der Rechts- und Versicherungsaspekte, die medizinischen und psychosozialen Folgen und der Einfluss auf das tägliche Leben, das eigene familiäre und soziale Leben sowie die berufliche und wirtschaftliche Situation.

Es wurde eine komplette Analyse aller Daten gemacht. Dazu wurden auch noch vergleichende Analysen von 3 Untergruppen gemacht die groß genug schienen und ausreichten homogen und repräsentativ für die jeweilige Bevölkerung zu sein, nämlich Dänemark (N=209) Belgien (N=91) und Westeuropa (N=274 darin: Niederland, Deutschland, Belgien, Luxemburg und Frankreich).

Wesentliche Ergebnisse

Die Analyse der Daten zeigte, dass eine große Anzahl der Befragten unter schweren Verletzungen litt (etwa 60%). Bedingt durch die Auswahlmethode ging es hierbei vor allem um: Verkehrsunfallopfer und/oder Patientenvertretungen. Bei den verschiedenen Gruppen der Straßenbenutzer waren die Autoinsassen am meisten vertreten (59,1 %) gefolgt von jeweils den motorisierten Zweirädern (16%), Radfahrern (14,6%) und Fußgängern (10,3%). Zusätzliche Analysen zeigten uns auch, dass diese Zusammensetzung ziemlich einheitlich in den verschiedenen Regionen war. Aufgrund dieser Verteilung und auch um Vergleiche der Resultate zu erreichen, wurden die Hauptanalysen getrennt nach dem Grad der Verletzung und der Art der Verkehrsteilnahme ausgeführt.

Mehr als 70% der Teilnehmer gaben an, dass ihrerseits kein menschlicher Faktor die Ursache des Unfalls war und nahezu 80% gaben an, dass der menschliche Faktor sowie das Verhalten des anderen Straßenbenutzers, der in den Unfall verwickelt war, die Hauptursache des Unfalls waren (unangepasstes Verhalten, und Unaufmerksamkeit/Ablenkung wurde am meisten erwähnt: 49% respektive 43% der Fälle). Nicht menschliche Faktoren (wie Wetterbedingungen, Fehler am Fahrzeug, Zustand der Straßeninfrastruktur) wurden bei 4 von 10 Fällen erwähnt.

Etwa die Hälfte der Opfer, unter denen die keine Schuld hatten, erschienen vor Gericht. Mehr als 50% waren nicht zufrieden mit dem Resultat der Prozedur, und über 66% waren nicht zufrieden mit deren Dauer. In 40% der Fälle dauerte die gerichtliche Prozedur länger als 3 Jahre. Was die Versicherung betrifft, berichtete ein Drittel der Teilnehmer, dass sie keine Entschädigung für Verletzungen und moralische Schäden erhalten hätten. Es überrascht nicht, dass die Zufriedenheit mit den Versicherungsleistungen auch recht gering war.

Schädeltrauma war die häufigste Verletzung unter den Autoinsassen (Fahrer und Insassen zusammen etwa 80%) und Fußgänger (etwa 60%) gefolgt von Wirbelsäulenverletzungen für Autoinsassen (50%) und Verletzungen der unteren Gliedmaßen bei Fußgängern (55%). Für Fahrradfahrer und Motoradfahrer waren die häufigsten Verletzungen nicht weiter definierte Verletzungen (55%-75%) gefolgt von Kopfverletzungen (60%) und Verletzungen der unteren Gliedmaßen (50%) sowie die oberen Gliedmaßen (45%-50%). Insgesamt betrug die Anzahl der betroffenen Körperregionen bei einem Unfall 2.26 und diese Zahl unterschied sich nicht wesentlich je nach Art der Verkehrsteilnahme. Die Schwere der Verletzung hing jedoch mit einer höheren Anzahl der verschiedenen verletzten Körperteile (3.03 gegen 1.84) und Verletzungen (6.5 versus 3.5) sowie mit einer viel niedrigeren Erholungsrate zusammen (etwa 20% gegen 50%).

Die entstandenen Verletzungen und deren Schwere scheinen mit bedeutungsvollen funktionellen Verlusten einher zu gehen, insbesondere mit Folgen in Bezug auf "täglichen Aktivitäten", "Schmerz", "Mobilität" und "Selbstversorgung". Funktionelle Einschränkungen waren grösser bei schweren als bei leichten Verletzungen. Es wurden keine signifikanten Unterschiede in Bezug auf die Art der Verkehrsteilnahme festgestellt.

Ein großer Anteil der Teilnehmer berichtete über psychologische Probleme, die häufigsten in Zusammenhang mit Symptomen von posttraumatischen Belastungsstörungen (ungefähr 60% der Befragten), Depressionen (etwa 55%) und Angstzuständen (ungefähr 45%). Schwere Verletzungen wurden auch in Zusammenhang mit höheren Angst und Depressionszuständen genannt (dies gilt jedoch nicht für posttraumatische Belastungsstörungen).

Im Durchschnitt wurde die Auswirkung des Unfalls auf das tägliche Leben, das sozio- emotionale Befinden und das Familienleben von den Unfallopfern als mäßig bewertet. Nichts desto trotz berichtete ein Drittel der Befragten, dass sie Unfallsfolgen für mindestens einen Familienangehörigen gehabt hätte (das private und berufliche Leben betreffend). Ein Drittel der Befragten berichtete auch, dass sie ihre Wohnung anpassen oder umziehen mussten, um eine bessere Anpassung an ihre Behinderung und funktionalen Einschränkungen zu erreichen. Im Vergleich zu den anderen Straßenbenutzern berichteten Radfahrer öfters, dass sie nach dem Unfall ihre Wohnung nicht verändern oder anpassen mussten. Schwerere Verletzungen wurden mit einer größeren Auswirkung auf all diese Aspekte empfunden, nämlich, das tägliche, sozio-emotionale und Familienleben, die Lebensbedingungen und das Umfeld.

Nahezu drei Viertel der Befragten musste ihre Arbeit einstellen oder ihre Studien unterbrechen, oft für eine lange Zeit oder sogar für immer. Allgemein war die Auswirkung des Unfalls auf die berufliche Aktivität am größten für Fußgänger: über 80% berichteten eine längere oder permanente Auszeit vom Beruf (81,8%) im Vergleich zu 70% für andere Verkehrsteilnehmer. Die Auswirkungen auf das Arbeitsleben zeigten sich auch bei schweren Verletzungen (85% längere oder dauerhafte Abwesenheit) und leichteren Verletzungen; obwohl für letztere der Einfluss geringer war, war er dennoch substantiell (50% längere oder permanente Abwesenheit). Fast 50% der Unfallopfer berichteten über ein geringeres monatliches Einkommen von mindestens 200€ und sogar 20% erlitten eine Einbuße von mindestens 1000€ pro Monat.

Der Vergleich zwischen Ländern und Regionen zeigte, dass die Unfallsfolgen in allen drei regionalen Gruppen (Dänemark, Belgien u. Westeuropa) erheblich waren. Die dänischen Befragten schienen jedoch weniger unter den Folgen zu leiden, als die beiden anderen Gruppen. Insbesondere berichteten die dänischen Befragten weniger oft die Schuld an dem Unfall zu haben, sowie unangepasstes Verhalten ihrerseits gehabt zu haben. Im Vergleich zu den anderen zwei Regionen, berichteten sie auch über eine bessere Effizienz der Justiz und Versicherungsapparates und weniger Folgen auf ihr tägliches, sozio-emotionelles und Familienleben. Auch ihre Lebenssituation und die professionelle und finanzielle Situation schienen besser hinsichtlich ihres eigenen und beruflichen Lebens zu sein. Schlussendlich bewerteten sie das öffentliche Gesundheitswesen und diesbezügliche Möglichkeiten die ihr Land bot als effizienter im Vergleich zu den Befragten aus den anderen Regionen. Überraschenderweise schienen sie aber unter größeren psychologischen Schwierigkeiten zu leiden, speziell bei PTSD und Angst Symptomen.

Die Befragung in Belgien zeigte die schlechtesten Ergebnisse für folgende Dimensionen: höchster Schuldanteil an Unfällen und unangepasstes menschliches Verhalten ihrerseits, geringste Effizienz und Zufriedenheit betreffend der Justiz und des Versicherungswesens (beides im Zusammenhang mit dem Resultat und der Länge der Prozedur). Auf der anderen Seite schnitt Belgien besser ab was die psychologischen Folgen betrifft, im Speziellen die PTSD und Angstsyndrome betreffend. Im Allgemeinen befanden sich die westeuropäischen Resultate zwischen den Bewertungen aus Dänemark und Belgien.

Schlussfolgerung und Diskussion

Obwohl die MyLAC Studie eine Reihe von Begrenzungen hatte (wie Heterogenität der Beispiele aus den verschiedenen Ländern, Befragung von Verkehrsunfallopfern sowie Patientenvertretungen, retrospektive und Selbstberichterstattung bei der Umfrage) können wir trotzdem einen wertvollen Einblick in die Natur und den Umfang der Folgen für die verletzten Unfallopfer und deren Angehörige bekommen.

Die Studienergebnisse führen zu folgenden Empfehlungen:

- *Die Justiz und Versicherungssysteme und Prozeduren müssen verbessert werden. Zum Beispiel könnten Fortschritte erzielt werden, wenn man die Angemessenheit und das Niveau der Kompensation besser an das was das Opfer wirklich braucht anpassen würde und auch die legalen Prozeduren vereinfachen und verkürzen würde. Es wäre auch von Nutzen, wenn man aus den guten Praktiken in Dänemark lernen könnte. Unsere Resultate zeigen, dass man die Situation in Dänemark, als gutes Beispiel, weiter untersuchen sollte.*
- *Die Zugänglichkeit und Sichtbarkeit von Hilfsorganisationen und Diensten müsste verbessert werden, genauso so wie die geleistete Qualität und das Angebot der Dienste. Nützlich wäre auch eine bessere Zusammenarbeit zwischen den verschiedenen Dienststellen für Unfallopfer mit den betroffenen Institutionen mit denen sie konfrontiert werden (wie Versicherungen, Justiz, Gesundheitswesen/geistige Gesundheitseinrichtungen usw.), um so eine integrierte, transdisziplinäre und persönliche Dienstleistung anbieten zu können. Bei solch einer Perspektive könnten die Opfervereinigungen als zentrale Plattform für die Hilfe und Unterstützung der Opfer und wenn möglich ihrer Angehörigen wirken. Sie könnten durch alle Schritte und Prozeduren nach dem Unfall begleiten, so wie Beistand, Wahrung und Verteidigung ihrer Rechte gewährleisten.*
- *Die Effizienz der Betreuung nach dem Unfall und Unterstützung für Unfallopfer muss verbessert werden, weil frühe und wirksame Interventionen das Maß an negativer Auswirkung nach einem Unfall merklich verringern können.*
- *Verkehrssicherheitskampagnen könnten auch das allgemeine Bewusstsein der Bevölkerung auf das langzeitige Leiden lenken, das nach einem Unfall im Straßenverkehr bei den Betroffenen auftritt. Solch eine Bewusstseinsbildung sollte auch in die Lernprozesse in Schulen und Fahrschulen integriert werden.*

Résumé (FR)

But et méthodologie

La mortalité est souvent considérée comme un indicateur principal et unique lorsqu'il s'agit d'évaluer un phénomène, une maladie ou un fléau dans le domaine de la santé publique. Néanmoins, pour réellement comprendre l'impact global sur le plan humain, il est également important d'en considérer les conséquences non-mortelles. Ceci vaut particulièrement en matière de sécurité routière puisque les collisions sur la route causent proportionnellement beaucoup plus de blessures non-mortelles que mortelles. Les blessures non-mortelles causées par la 'route' sont en effet estimées être vingt fois plus nombreuses que les blessures mortelles (OMS 2009). Celles-ci peuvent par ailleurs une influence majeure, non seulement sur la qualité de vie du survivant – parfois très intense et de longue durée – mais aussi sur celle de son entourage et, plus globalement, sur la société en général. A cet égard, il reste encore beaucoup à faire pour réduire l'impact négatif des collisions sur la route sur la vie de ceux qui sont directement concernés et sur celle de leurs proches.

L'objectif du projet MyLAC – coordonné conjointement par l'Institut Vias et par la Fédération européenne des Victimes de la Route (FEVR) – est d'obtenir une meilleure compréhension des conséquences sur le plan humain des collisions non-mortelles de la route.

En ces termes, trois aspects majeurs ont été considérés :

- *approfondir la connaissance et la compréhension des conséquences 'humaines' pour les victimes blessées ;*
- *déterminer les facteurs qui pourraient contribuer à une meilleure qualité de vie pour celles-ci ;*
- *renforcer les arguments en faveur d'un investissement continu pour améliorer l'aide et l'assistance aux victimes, l'intervention et le suivi post-collision (Post crash response) et, plus généralement, les mesures en matière de sécurité routière.*

L'étude MyLAC, qui a été menée à l'échelle internationale, avait pour but d'investiguer de manière rétrospective les conséquences des collisions de la route et ce, à partir de différents points de vue : médical, psychologique, social et économique.

L'enquête qui a permis la récolte de données a été traduite en 15 langues et diffusée sur une période de 5 mois (mai – septembre 2016) par plus de 40 associations et institutions partenaires du projet (associations/institutions d'assistance aux victimes, d'aide au handicap ou encore de promotion de la sécurité routière) et ce, à travers 20 pays membres de l'Union européenne. Au total 755 victimes blessées ont répondu à l'enquête.

Le questionnaire MyLAC consistait en 90 items/questions couvrant les dimensions suivantes : les circonstances de la collision, la qualité et durée de la procédure juridique, les aspects liés aux assurances, les conséquences médicales et psychosociales, l'impact sur la vie quotidienne et sociale de la victime et sur son entourage, et enfin les conséquences professionnelles et économiques. Les analyses principales ont été effectuées sur l'entièreté de l'échantillon. En corollaire, des analyses complémentaires et comparatives ont été effectuées sur trois sous-échantillons jugés suffisamment larges, homogènes et représentatifs : le Danemark (N=209), la Belgique (N=91) et l'Europe de l'Ouest (N=274 ; incluant les Pays-Bas, l'Allemagne, la Belgique, le Luxembourg et la France).

Résultats

L'analyse descriptive de l'échantillon montre qu'une large proportion de l'échantillon souffre de blessures graves (environ 60%). Cette surreprésentation des victimes grièvement blessées – comparativement aux statistiques nationales et internationales – est vraisemblablement liée à la méthode de sélection (i.e. par le biais associations/institutions d'assistance aux victimes, d'aide au handicap ou encore de promotion de la sécurité routière). Concernant le type d'usager de la route, les occupants de véhicules à quatre roues (passagers et conducteurs) sont les plus représentés (59,1%) suivis respectivement par les deux roues motorisées (16%), les cyclistes (14,6%) et les piétons (10,3%). Des analyses complémentaires ont par ailleurs montré que la composition de l'échantillon était assez homogène au sein de différentes sous-régions. Afin d'assurer une bonne interprétabilité des résultats et éviter les biais potentiels, toutes les analyses ont été effectuées séparément pour les différents niveaux de gravité des blessures et pour les différents types d'usagers de la route.

Plus de 70% des répondants ont indiqué qu'aucune action humaine de leur part n'était en cause dans la collision et quelques 80% ont rapporté ne pas avoir été considérés en tort. Dans plus de 80% des cas, l'action humaine de l'autre/des autres usager(s) de la route impliqué(s) dans la collision a été incriminée comme ayant pu être un facteur causal dans la collision (comportement inapproprié et inattention/distraction les plus fréquemment cités respectivement dans 49% et 43% des cas). Les facteurs non-humains (i.e. conditions météorologiques, défaut au véhicule, état de la route et de l'infrastructure) ont par ailleurs été mentionnés dans 4 cas sur 10 comme cause potentielle de la collision.

Près de la moitié des victimes – parmi celles n'ayant pas été considérées en tort – est passée par la voie judiciaire. Plus de la moitié d'entre elles n'a pas été satisfaite avec le résultat de la procédure et 66% pas satisfaite non plus quant à la durée de la procédure (dans 40% des cas, la procédure légale a duré plus de 3 ans). Concernant les aspects liés aux assurances, près d'un tiers des répondants déclare n'avoir reçu aucune compensation ni pour leurs blessures, ni les dommages moraux.

Le traumatisme crânien est la blessure la plus fréquente parmi les occupants de voiture (environ 80%) et parmi les piétons (environ 60%), suivie des blessures à la colonne vertébrale pour les occupants de voitures (50%) et des blessures aux membres inférieurs pour les piétons (55%). Pour les cyclistes et motocyclistes, les blessures les plus fréquentes sont les blessures non-spécifiées (55% à 75%) suivies par les blessures à la tête (60%) et aux membres inférieurs (50%) et supérieurs (45% à 50%). En moyenne, le nombre de régions corporelles touchées est de 2,26 et le nombre de blessures est de 5,34. On n'observe pas de différence à ce niveau entre les différents usagers de la route. La sévérité des blessures est quant à elle associée à un nombre plus important de régions corporelles impactées (3.03 vs 1.84) et blessures (6.5 vs 3.5). Par ailleurs seuls 20% des blessés graves rapportent avoir récupéré totalement contre 50% dans le cas des blessures moins graves.

Les blessures subies - et en particulier leur gravité - semblent être associées à des pertes fonctionnelles importantes, en particulier dans les dimensions "activités de la vie quotidienne", "douleur", "mobilité" et "autogestion". La perte fonctionnelle est plus importante pour les blessures graves. Aucune différence significative relative au mode de transport n'a par ailleurs été identifiée.

Une forte proportion de répondants ont signalé des difficultés psychologiques, dont les plus fréquentes étaient liées aux symptômes du trouble de stress post-traumatique (SSPT, environ 60 % de l'échantillon), de la dépression (environ 55 %) et du trouble anxieux (environ 45 %). Les blessures plus graves sont associées à des taux accrus d'anxiété et de dépression (mais non au SSPT).

En moyenne, l'impact de l'accident sur la vie quotidienne, la vie socio-émotionnelle et familiale a été jugé modéré par les victimes. Néanmoins, plus d'un tiers de l'échantillon a déclaré que l'accident avait eu des conséquences pour au moins un membre de l'entourage (sur la vie privée ou professionnelle). Un tiers de l'échantillon rapporte également avoir dû adapter son logement ou avoir dû déménager pour permettre une meilleure adaptation à leur situation d'invalidité ou de limitations fonctionnelles. Comparativement aux autres usagers de la route, une plus grande proportion de cyclistes signale ne pas avoir dû adapter leur condition d'habitation. Enfin, un impact plus important sur tous ces aspects - à savoir la vie quotidienne, socio-émotionnelle et familiale et les conditions de vie et d'habitation - a été observé pour les victimes blessées grièvement (comparativement aux autres).

Près des trois quarts de l'échantillon ont déclaré avoir dû quitter le travail ou interrompre leurs études pendant une longue période (trois mois ou plus) ou de façon permanente. Globalement, l'impact de l'accident sur l'activité professionnelle est le plus important pour les piétons: plus de 80 % d'entre eux signalent un arrêt prolongé ou permanent de leur activité professionnelle (81,8 %) contre environ 70 % pour les autres usagers de la route. L'impact sur la vie au travail est également évident tant pour les victimes blessées grièvement (85 % d'absences prolongées ou permanentes) que pour les autres (blessures légères à modérées). Bien que l'impact soit plus faible pour ces dernières, il reste néanmoins substantiel (50 % d'absences prolongées ou définitives). Enfin, près de 50% des victimes rapportent une baisse de leur revenu mensuel d'au moins 200 € et environ 20% une baisse d'au moins 1 000 €.

La comparaison entre pays et régions a montré que les conséquences de l'accident étaient importantes dans chacun des sous-échantillons observés (Danemark, Belgique et Europe occidentale). Toutefois, il a été démontré que les sous-échantillons danois souffraient globalement de conséquences moins sévères que les deux autres sous-échantillons. En particulier, les répondants danois rapportent moins souvent avoir été considérés en tort et être à l'origine d'actions humaines inappropriées ayant pu causer la collision. Ils font également état d'une bien meilleure efficacité - par rapport

aux deux autres sous-échantillons - des systèmes de justice et d'assurance et d'un moindre impact sur leur vie quotidienne, socio-émotionnelle et familiale, sur leur entourage et sur leur situation professionnelle et financière. Enfin, leur réponse rend également compte d'une plus grande efficacité des ressources en matière de santé publique en place dans leur pays, comparativement aux deux autres sous-échantillons. De manière surprenante, le sous-échantillon danois rapporte des difficultés psychologiques plus importantes, en particulier en ce qui concerne le SSPT et les symptômes d'anxiété.

Les répondants du sous-échantillon belge ont montré les résultats les plus médiocres des trois sous-échantillons pour les dimensions suivantes: le taux le plus élevé de collisions imputables à leur faute ou à des actions inappropriées de leur part ; le taux le plus faible d'efficacité - et de satisfaction - des systèmes judiciaires et d'assurance (tant en termes de résultats que de durée de procédures). Néanmoins, ils rapportent des difficultés psychologiques moins importantes, notamment en ce qui concerne le SSPT et les symptômes liés à l'anxiété. Dans l'ensemble, le sous-échantillon d'Europe occidentale a présenté des résultats intermédiaires par rapport à ceux observés dans les sous-échantillons danois et belge.

Conclusions et discussion

Même si l'étude MyLAC a un certain nombre de limites (e.g. hétérogénéité du taux de réponse dans les différents pays, biais de sélection, nature rétrospective et auto-rapportée de l'enquête), elle permet néanmoins d'appréhender de manière pertinente la nature et l'ampleur des conséquences des collisions de la route sur les victimes blessées et leur entourage.

Les conclusions de cette étude nous mènent aux recommandations suivantes:

- Le système judiciaire et celui des assurances ainsi que les procédures y relatives devraient être améliorés. Par exemple, des efforts importants devraient être consentis pour améliorer l'adéquation des 'réponses' du système judiciaire et des assurances (e.g. niveau de compensation) aux besoins et réalités des victimes et également pour faciliter et accélérer les procédures légales ou de compensation. A cet égard, s'inspirer des bonnes pratiques en la matière semble utile et nos résultats tendent à démontrer que le cas du Danemark serait un exemple à suivre.
- L'accessibilité et la visibilité des organisations d'aide aux victimes et des services y relatifs devraient être améliorés, de même pour la qualité et l'étendue des services proposés. Des efforts sont aussi nécessaires pour améliorer et augmenter les synergies et les collaborations entre les différents acteurs auxquels les victimes sont confrontées (comme les compagnies d'assurances, les institutions judiciaires, les services médicaux et de santé mentale, etc.) et ce, dans le but de pouvoir proposer une offre intégrative de services à la fois interdisciplinaire et personnalisée. Dans cette perspective les associations ayant l'aide et l'assistance aux victimes dans leur prérogative pourraient agir en tant que plateforme centrale pour aider et assister les victimes- et si possible aussi leur entourage- et ce, pour toutes les étapes et procédures après une collision (y compris l'assistance pour la défense de leurs droits). L'efficacité de la phase après la collision (post crash response) et des services d'aide aux victimes est cruciale - les interventions précoces et appropriées ont en effet démontré leur faculté à réduire substantiellement l'impact délétère des collisions pour les victimes.
- Les campagnes de sécurité routière devraient aussi servir à conscientiser les usagers de la route et montrer les effets à long terme qui résultent des collisions de la route. De telles sensibilisations pourraient par ailleurs s'opérer de manière préventive en faisant, par exemple, partie du programme éducatif scolaire ou du système d'apprentissage à la conduite.

Resumen (ES)

Objetivo y metodología

La mortalidad se considera a menudo como el principal indicador en una situación relacionada con la salud pública. Pasa lo mismo en el caso de lesiones relacionadas con el tráfico. Sin embargo, para entender el impacto humano en su conjunto, también hay que considerar las consecuencias no mortales.

Esto es particularmente cierto en el contexto de la seguridad vial, ya que la mayoría de los siniestros suponen lesiones, muchas de las cuales tienen un impacto a largo plazo. Los accidentes de tráfico son responsables de muchas lesiones graves, que se estiman 20 veces más frecuentes que las muertes (Organización Mundial de la Salud, 2009). Las lesiones relacionadas con el tráfico pueden, además, tener un gran impacto, no solo en la calidad de vida del superviviente de un accidente - a veces en un grado considerable y durante un largo periodo de tiempo - sino también en su familia y más ampliamente, en la sociedad en general. Queda mucho por hacer para disminuir el posible impacto negativo de los accidentes de tráfico en la vida de las personas directamente involucradas y en la de sus familiares.

El propósito del proyecto MyLAC, realizado conjuntamente por el instituto Vías y la Federación Europea de Víctimas de la Carretera (FEVR), era lograr una mayor comprensión de las posibles consecuencias de los siniestros de tráfico para las víctimas lesionadas.

Más concretamente, el objetivo era triple:

- *conocer mejor las posibles consecuencias de las lesiones causadas por accidentes de tráfico;*
- *determinar los factores que podrían contribuir a una mejor calidad y mayor nivel de vida de las víctimas;*
- *reforzar los argumentos a favor de una inversión continuada en respuesta post-accidente, en apoyo y asistencia a las víctimas, así como en medidas de seguridad vial en general.*

MyLAC es un estudio retrospectivo internacional que tuvo como objetivo estudiar las consecuencias de los accidentes de tráfico desde diferentes puntos de vista, incluidos los médicos, psicológicos, sociales y económicos. La encuesta se tradujo a 15 idiomas y se difundió on line durante un período de 5 meses (de mayo a septiembre de 2016) por más de 40 organizaciones (Asociaciones de tráfico y de asistencia al paciente) en 20 Estados miembros de la UE. Un total de 755 víctimas lesionadas respondieron a las preguntas de la encuesta.

El cuestionario MyLAC consta de 90 secciones que cubren las siguientes dimensiones: las circunstancias del accidente, la calidad y duración de los procedimientos legales y los aspectos relacionados con los seguros, las consecuencias médicas y psicosociales, el impacto en la vida diaria, personal, familiar y social y en la situación profesional y económica. Se realizó un análisis general del total de la muestra. Además, se realizaron análisis comparativos en tres submuestras que se consideraron suficientemente grandes y suficientemente homogéneas y representativas de su población, a saber: Dinamarca (N = 209), Bélgica (N = 91) y Europa occidental (N = 274, incluidos Los Países Bajos, Alemania, Bélgica, Luxemburgo y Francia).

Resultados clave

El análisis descriptivo de la muestra reveló que un gran porcentaje sufrió lesiones graves (alrededor del 60%), lo que se debió probablemente al método de selección (es decir, a través de organizaciones de víctimas de tráfico y/o de pacientes). En cuanto al tipo de usuarios de la carretera, los ocupantes de vehículos de cuatro ruedas fueron los más representados (59.1%), seguidos respectivamente por vehículos motorizados de dos ruedas (16.0%), ciclistas (14.6%) y peatones (10.3%). Los análisis complementarios también mostraron que la composición de la muestra era bastante heterogénea en las subregiones. A este respecto, y para poder comparar los resultados, los análisis principales se llevaron a cabo por separado en función de los niveles de gravedad y de los tipos de usuarios de la carretera.

Más del 70% de los encuestados afirmaron que ninguna acción humana por su parte fue el factor causal del accidente y casi el 80% de ellos indicaron no tener culpa alguna. En más del 80% de los casos, el comportamiento humano u otros factores humanos de los demás usuarios de la carretera involucrados en el accidente se consideraron el principal factor causal del accidente (el comportamiento inadecuado y la falta de atención / distracción son los más frecuentes en el 49% y el 43% de los casos, respectivamente). En 4 de cada 10 casos se señalaron factores no humanos (por ejemplo, condiciones climáticas, fallo del vehículos, condiciones de la carretera / infraestructura).

Alrededor de la mitad de las víctimas - de las que no tuvieron culpa alguna - comparecieron ante el tribunal. Más del 50% de éstas no quedaron satisfechas con el resultado del procedimiento, y el 66% no quedaron satisfechos con la duración del mismo - en el 40% de los casos, los procedimientos legales duraron más de tres años. En cuanto a los aspectos relacionados con los seguros, un tercio de los entrevistados declaró que no había recibido compensación por lesiones o daños morales. Como era de esperar, la satisfacción con las indemnizaciones del seguro también fue bastante baja.

El traumatismo craneal es la lesión más común entre los ocupantes de vehículos de cuatro ruedas (aproximadamente un 80%, combinando conductores y pasajeros) y entre los peatones (aproximadamente 60%), seguidos de lesiones espinales en ocupantes de vehículos de cuatro ruedas (50%) y lesiones en extremidades inferiores en peatones (55%). Para ciclistas y motociclistas, las lesiones más comunes son lesiones inespecíficas (55% a 75%) seguidas de lesiones en la cabeza (60%), miembros inferiores (50%) y miembros superiores (45% a 50%). En general, la media de regiones del cuerpo afectadas por el accidente fue de 2.26, cifra que no difirió significativamente en función del modo de transporte. La gravedad, sin embargo, se asoció a un mayor número de regiones corporales afectadas (3,03 frente a 1,84) y lesiones (6,5 frente a 3,5) y una tasa de recuperación total mucho más baja (alrededor del 20% frente al 50%).

Las lesiones sufridas, y en particular su gravedad, parecen estar asociadas a importantes pérdidas funcionales, particularmente en cuestiones de "actividades de la vida diaria", "dolor", "movilidad" y "autocuidado". La pérdida funcional es más importante en lesiones graves. No se identificaron diferencias significativas según el modo de transporte.

Un gran porcentaje de los encuestados señaló dificultades psicológicas, la más común de las cuales se relacionó con síntomas de trastorno por estrés postraumático (aproximadamente el 60% de la muestra), depresión (aproximadamente el 55%) y trastorno de ansiedad (aproximadamente el 45%). Las lesiones más graves se han asociado con mayores tasas de ansiedad y depresión (pero no con el trastorno de estrés postraumático).

En promedio, las víctimas evaluaron el impacto del siniestro en la vida cotidiana, la vida socio-emocional y la vida familiar como moderado. Sin embargo, más de un tercio de la muestra informó que el siniestro había tenido consecuencias para al menos uno de sus familiares (en su vida personal o profesional). Un tercio de la muestra también informó haber adaptado

su vivienda o haber tenido que mudarse, para adaptarse mejor a su situación de discapacidad o limitaciones funcionales. En comparación con otros usuarios de la carretera, los ciclistas indicaron con mayor frecuencia que no tuvieron que modificar / adaptar su vivienda por motivo del accidente. Las lesiones más graves han resultado estar asociadas con un mayor impacto en todos estos aspectos, a saber, la vida cotidiana, socioemocional y familiar de la víctima, su condición de vida y su entorno.

Cerca de tres cuartas partes de la muestra tuvieron que dejar el trabajo o interrumpir sus estudios por un tiempo prolongado o de manera permanente. En general, el impacto del accidente en la actividad profesional es más alto para los peatones: más del 80% indica una baja prolongada o permanente en la vida laboral (81,8%) en comparación con alrededor del 70% para otros usuarios de la carretera. El impacto en la vida laboral también fue evidente tanto en el caso de lesiones graves (85% de baja prolongada o permanente) como para lesiones más leves; aunque para este último parámetro el impacto es menor, sigue siendo sustancial (el 50% de ausencia prolongada o definitiva). Finalmente, casi el 50% de las víctimas informaron de una disminución en sus ingresos mensuales de al menos 200€, y alrededor del 20% de ellos una pérdida de al menos 1.000€.

La comparación entre países/regiones mostró que las consecuencias del siniestro fueron sustanciales en cada una de las submuestras observadas (es decir, Dinamarca, Bélgica y Europa occidental). Sin embargo, se demostró que en general las submuestras danesas sufrieron consecuencias menos drásticas que las otras dos submuestras. En particular, los encuestados daneses informaron con menos frecuencia haber sido considerados culpables del accidente o haber realizado acciones humanas inapropiadas por su parte. En comparación con las otras dos submuestras, también señalaron mayor eficiencia de la justicia y de las compañías de seguros y menos consecuencias importantes en su vida cotidiana, socioemocional y familiar, en su situación personal, profesional y financiera y en la vida de sus familiares. Finalmente, también calificaron los recursos e instalaciones de salud pública proporcionados en su propio país como mucho más eficientes que las otras dos submuestras. Sin embargo, sorprendentemente padecieron dificultades psicológicas más importantes, en particular, con respecto al TEPT y los síntomas de ansiedad.

Los encuestados de la submuestra de Bélgica mostraron los peores resultados en los siguientes parámetros: mayores tasas de culpa en los accidentes y de acciones humanas inapropiadas por su parte; menor eficiencia - y satisfacción - de los sistemas judiciales y de compañías de seguros (tanto en términos de resultados como de duración de los procedimientos). Por otro lado, puntuaron mejor en términos de las consecuencias psicológicas, en particular para el TEPT y los síntomas relacionados con la ansiedad. En general, la submuestra de Europa occidental mostró resultados intermedios entre las submuestras danesas y belgas.

Conclusión y discusión

A pesar de que el estudio MyLAC tiene una serie de limitaciones (por ejemplo en cuanto a la heterogeneidad de las submuestras entre diferentes países, los criterios de selección aplicados por las asociaciones de víctimas de tráfico y/o de pacientes, la naturaleza retrospectiva y de autoinforme de la encuesta), proporciona una valiosa información sobre la naturaleza y el alcance de las consecuencias para las víctimas de tráfico lesionadas y sus familiares.

Los resultados del estudio conducen a las siguientes recomendaciones:

- *Se deberían mejorar los sistemas y procedimientos judiciales y de seguros. Por ejemplo, se podría mejorar la adecuación y el nivel de las compensaciones a las necesidades reales de las víctimas y simplificar y acelerar los procedimientos legales. Podría ser útil aprender de las mejores prácticas sobre estos temas; nuestros resultados sugieren que los procedimientos en Dinamarca podrían ser un caso interesante a estudiar.*
- *Se debería mejorar la accesibilidad y la visibilidad de las organizaciones y servicios de apoyo a las víctimas, así como la calidad y la gama de servicios. Son necesarios esfuerzos para aumentar la colaboración entre los diferentes agentes involucrados a las que las víctimas lesionadas tienen que hacer frente (por ejemplo, seguros, justicia, servicios de salud / salud mental, etc.) con el objetivo de ofrecer servicios integrados, interdisciplinarios y personalizados. Desde esta perspectiva, las asociaciones o servicios de víctimas podrían operar como una plataforma central que podría ayudar y apoyar a las víctimas - y posiblemente también a sus familiares - en todos los pasos y procedimientos posteriores al accidente, incluyendo la asistencia para la defensa de sus derechos.*
- *Es necesario mejorar la eficacia de los servicios de apoyo y de respuesta post-accidente para las víctimas, ya que las intervenciones tempranas y apropiadas tienen el potencial de reducir sustancialmente algunos de los impactos nocivos de un accidente de tráfico.*
- *Las campañas de seguridad vial también deberían utilizarse para sensibilizar a las personas sobre los sufrimientos a largo plazo que resultan de los siniestros de tráfico. Esta concienciación también debería integrarse en la educación escolar básica o incluso en los sistemas educativos de conducción.*

Samenvatting (NL)

Doel en methodologie

Sterfte wordt vaak beschouwd als de belangrijkste indicator van een medische aandoening of epidemie. Om de menselijke impact ervan volledig te begrijpen, is het echter ook van belang rekening te houden met de niet-fatale gevolgen. Dit geldt met name voor verkeersongevallen, aangezien de meeste hiervan tot verwondingen leiden waarvan veel een blijvende impact hebben. Ongevallen zijn verantwoordelijk voor veel ernstige gewonden, wereldwijd geschat op 20 keer meer dan sterfgevallen (World Health Organization, 2009). Verkeersgerelateerde verwondingen kunnen bovendien niet enkel een grote invloed hebben op de levenskwaliteit van de overlevende van een ongeval - soms in aanzienlijke mate en voor lange tijd - maar ook op zijn familie en meer in het algemeen op de samenleving in haar geheel. Er moet nog veel worden gedaan om de mogelijke negatieve impact van verkeersongevallen op de levens van direct betrokkenen en hun familieleden te verminderen.

Het doel van het MyLAC-project - gezamenlijk uitgevoerd door Vias institute en de Europese Federatie van Verkeersslachtoffers (FEVR) - was om een beter inzicht te krijgen in de reikwijdte van de gevolgen van verkeersongevallen voor gewonde slachtoffers. Meer specifiek was het doel drievoudig:

- *inzicht verwerven in de reikwijdte van de gevolgen van letsels veroorzaakt door verkeersongevallen;*
- *om de factoren te bepalen die kunnen bijdragen tot een betere kwaliteit en levensstandaard voor slachtoffers;*
- *argumenten te ontwikkelen voor voortgezette investering in de respons/opvang na een ongeval en voor de ondersteuning en bijstand aan slachtoffers alsmede voor verkeersveiligheidsmaatregelen in het algemeen.*

MyLAC is een internationale retrospectieve studie die gericht was op het bestuderen van de gevolgen van verkeersongevallen vanuit verschillende invalshoeken, waartussen medische, psychologische, sociale en economische. De enquête werd in 15 talen vertaald en online verspreid over een periode van 5 maanden (mei tot september 2016) door meer dan 40 organisaties (patiëntenverenigingen en verenigingen voor verkeersslachtoffers) in 20 lidstaten van de EU. In totaal hebben 755 gewonde slachtoffers de vragen in de enquête beantwoord.

De MyLAC-vragenlijst bestaat uit 90 items met betrekking tot de volgende dimensies: de omstandigheden van het ongeval, de kwaliteit en duur van de juridische procedures en de verzekeringsaspecten, de medische en psychosociale gevolgen, de impact op het dagelijks leven, op het persoonlijke, familiaal en sociaal leven en op de professionele en economische situatie. Er werd een algemene analyse van de totale steekproef gemaakt. Bovendien werden vergelijkende analyses uitgevoerd op drie substeekproeven die groot genoeg en voldoende homogeen en representatief voor hun populatie werden geacht, namelijk: Denemarken (N = 209), België (N = 91) en West-Europa (N = 274, inclusief Nederland, Duitsland, België, Luxemburg en Frankrijk).

Belangrijkste resultaten

De beschrijvende analyse van de steekproef toonde aan dat een groot deel van de bevraagden leed aan een ernstig letsel (ongeveer 60%); dit was klaarblijkelijk toe te schrijven aan de selectiemethode (d.w.z. via slachtoffers- en/of patiëntenorganisaties). Wat het type weggebruikers betreft, waren de inzittenden van vierwielers het meest vertegenwoordigd (59,1%), gevolgd door respectievelijk gemotoriseerde tweewielers (16,0%), fietsers (14,6%) en voetgangers (10,3%). Complementaire analyses toonden ook aan dat de samenstelling van de steekproef vrij heterogeen was in subregio's. In dit verband en om vergelijking van resultaten mogelijk te maken, werden de belangrijkste analyses afzonderlijk uitgevoerd op basis van de letselernst en de soorten van weggebruikers.

Meer dan 70% van de respondenten verklaarde dat geen enkele menselijke actie van hun kant een oorzakelijke factor was in de crash en bijna 80% van hen zei dat zij niet fout waren. In meer dan 80% van de gevallen werd het menselijk gedrag of andere menselijke factoren van andere weggebruiker(s) die bij de crash betrokken waren, als de belangrijkste oorzakelijke factor in de crash beschouwd (ongepast gedrag en onoplettendheid/afleiding waren de meest frequent gerapporteerde in respectievelijk 49% en 43% van de gevallen). Niet-menselijke factoren (bijvoorbeeld weersomstandigheden, voertuigdefecten, weg-/infrastructuuromstandigheden) werden in 4 op 10 gevallen gerapporteerd.

Ongeveer de helft van de slachtoffers - waaronder zij die niet on fout waren - verscheen voor de rechtbank. Meer dan 50% van hen was niet tevreden met de uitkomst van de procedure en 66% was niet tevreden over de duur ervan. In 40% van de gevallen duurde de juridische procedure meer dan drie jaar. Wat de verzekeringsaspecten betreft, verklaarde één derde van de geïnterviewden dat zij geen vergoeding voor verwondingen of morele schade ontvangen hadden. Zoals te verwachten, was de tevredenheid over de verzekeringsvoordelen ook vrij laag.

Hoofdtrauma is de meest voorkomende verwonding bij inzittenden van vierwielers (bestuurders en passagiers samen, ongeveer 80%) en voetgangers (ongeveer 60%), gevolgd door rugletsel voor inzittenden van vierwielers (50%) en letsel aan de onderste ledematen voor voetgangers (55%). Voor fietsers en motorrijders zijn de meest voorkomende verwondingen niet-gespecificeerde verwondingen (55% tot 75%), gevolgd door verwondingen aan het hoofd (60%), aan de onderste ledematen (50%) en bovenste ledematen (45% tot 50%). In het algemeen bedroeg het gemiddeld aantal gekwetste lichaamsdelen in de crash 2.26, en dit cijfer verschilde niet significant per vervoerswijze. Een hogere ernst was

echter geassocieerd met een hoger aantal aangetaste lichaamsdelen (3,03 versus 1,84) en verwondingen (6,5 versus 3,5) en een veel langere volledige genezingsduur (ongeveer 20% versus 50%).

De opgelopen verwondingen, en in het bijzonder de ernst ervan, zijn klaarblijkelijk geassocieerd met aanzienlijke functionele verliezen, met name op de dimensies van 'activiteiten van het dagelijks leven', 'pijn', 'mobiliteit' en 'zelfzorg'. Functieverlies was belangrijker bij ernstige verwondingen. Er werden geen significante verschillen geïdentificeerd met betrekking tot de transportmodus bij de crash.

Een groot deel van de respondenten meldde psychische problemen, waarvan de meest voorkomende gerelateerd waren aan symptomen van posttraumatische stressstoornis (ongeveer 60% van de steekproef), depressie (ongeveer 55%) en angststoornis (ongeveer 45%). Meer ernstige verwondingen waren geassocieerd met een verhoogde graad van angst en depressie (maar niet posttraumatische stressstoornis).

Gemiddeld werd de impact van de crash op het dagelijks leven, het sociaal-emotioneel leven en het gezinsleven door de slachtoffers als matig beoordeeld. Nochtans meldde meer dan één derde van de steekproef dat de crash gevolgen had voor ten minste één van hun familieleden (in privé- of beroepsleven). Eén derde van de steekproef meldde ook dat zij hun woning hadden aangepast of moesten verhuizen en dit voor een betere aanpassing aan hun situatie van fysische beperking of functionele beperking. In vergelijking met andere weggebruikers meldden fietsers vaker dat ze hun accommodatie niet hoefden aan te passen vanwege de crash. Meer ernstige verwondingen blijken geassocieerd te zijn met een grotere impact op al deze aspecten, namelijk het dagelijks, sociaal-emotioneel en gezinsleven, de leefomstandigheden en de omgeving van het slachtoffer.

Bijna driekwart van de steekproef zei dat ze het werk of hun opleiding voor langere tijd of permanent moesten onderbreken. Over het algemeen is de impact van de crash op de beroepsactiviteit het hoogst voor voetgangers: meer dan 80% meldt een langdurige of permanente terugtrekking uit het beroepsleven (81,8%), vergeleken met ongeveer 70% voor de andere weggebruikers. De impact op het beroepsleven was ook duidelijk voor zowel ernstige verwondingen (85% langdurige of permanente afwezigheid) als voor lichtere verwondingen; hoewel voor deze laatste de impact lager is, blijft die toch substantieel (50% langdurige of definitieve afwezigheid). Ten slotte meldde bijna 50% van de slachtoffers een daling van hun maandelijks inkomen van minstens € 200 en ongeveer 20% daarvan een daling van minstens € 1.000.

Uit de vergelijking tussen landen en regio's bleek dat de gevolgen van het ongeval aanzienlijk waren in elk van de genomen substeekproeven (dat wil zeggen Denemarken, België en West-Europa). De Deense substeekproeven bleken gemiddeld minder ernstige gevolgen te hebben dan de andere substeekproeven. In het bijzonder meldden Deense respondenten dat ze minder vaak werden beschouwd als de partij die in fout was en dat ze minder vaak een menselijke fout hadden begaan. Ze rapporteerden ook een veel grotere efficiëntie in vergelijking met de twee andere substeekproeven van de instanties voor justitie en verzekering, en minder grote gevolgen voor hun dagelijks, sociaal-emotioneel en familiaal leven, hun woonsituatie, hun professionele en financiële situatie en hun familieleden/verwanten leven. Ten slotte beoordeelden zij ook de middelen en faciliteiten voor volksgezondheid in eigen land als veel efficiënter dan in de twee andere substeekproeven. Verrassend genoeg werd echter aangetoond dat ze grotere psychologische problemen hadden, in het bijzonder met betrekking tot PTSS en angstsymptomen.

De respondenten in de Belgische substeekproef toonden de slechtste resultaten voor volgende dimensies: de hoogste percentages van ongevallen waarbij zij in fout waren of ongepaste menselijke actie hadden gemaakt, de laagste efficiëntie en tevredenheid van de gerechtelijke en de verzekeringsinstanties (zowel qua resultaten als qua duur van de procedures). Aan de andere kant scoorden ze beter in termen van psychologische gevolgen, in het bijzonder voor PTSS en angstgerelateerde symptomen. In het algemeen liet de West-Europese deelsteekproef tussenliggende resultaten zien tussen de Deense en de Belgische deelsteekproeven in.

Conclusie en discussie

Hoewel het MyLAC-onderzoek een aantal beperkingen kent (bijv. heterogeniteit van substeekproeven tussen verschillende landen, selectiebias door verkeersslachtoffer- en/of patiëntenverenigingen, retrospectief en zelfrapporteerd karakter van de enquête), biedt het niettemin waardevol inzicht in de aard en de omvang van de gevolgen voor gewonde verkeersslachtoffers en hun familieleden.

De onderzoeksresultaten leiden tot volgende aanbevelingen:

- *De gerechtelijke en verzekeringsinstanties en procedures moeten worden verbeterd. Er zou bijvoorbeeld vooruitgang geboekt kunnen worden om de geschiktheid en het niveau van vergoeding beter af te stemmen op de behoeften en de realiteit van het slachtoffer, en de juridische procedures te vereenvoudigen en te versnellen. Leren van goede praktijken over deze onderwerpen lijkt nuttig; de resultaten suggereren dat de procedures in Denemarken een interessante casus zouden kunnen zijn om te bestuderen.*
- *De toegankelijkheid en de zichtbaarheid van organisaties en diensten voor slachtofferhulp moeten worden verbeterd, evenals de kwaliteit en het aanbod van hun diensten. Er zijn inspanningen nodig om de samenwerking tussen de verschillende actoren waarmee de getroffen slachtoffers geconfronteerd worden (verzekeringen, justitie, gezondheids-/geestelijke gezondheidszorg, enz.), te versterken om geïntegreerde, transdisciplinaire en gepersonaliseerde diensten aan te bieden. In dergelijk perspectief zouden de slachtofferverenigingen en -diensten kunnen fungeren als een centraal platform dat de slachtoffers - en mogelijk ook hun familieleden - zou*

kunnen helpen en ondersteunen bij alle stappen en procedures na de crash, met inbegrip van rechtshulp en dito bijstand.

- *De efficiëntie van de post-crash respons en de ondersteunende diensten voor slachtoffers moet worden verbeterd, omdat vroege en passende interventies het potentieel hebben enkele van de schadelijke effecten van een verkeersongeval aanzienlijk te verminderen.*
- *Verkeersveiligheidscampagnes moeten ook worden aangewend om het bewustzijn van mensen over het langdurig leed als gevolg van een verkeersongeval, te vergroten. Dergelijke bewustmaking moet ook geïntegreerd worden in de burgerschapsvorming in het onderwijs en/of zelfs in het rijschoolstelsel.*

1. Introduction

1.1. General context

Mortality is often considered as the primary indicator of the scale of a health problem. This also applies to road traffic injuries. However, in order to fully consider the burden of health problems, it is also important to take into account non-fatal outcomes. Road crashes cause numerous serious traffic injuries which are typically estimated as 20 times more frequent than fatalities (World Health Organization, 2009). Globally up to 50 million people incur non-fatal injuries each year as a consequence of road crashes, with many incurring a permanent disability as a result of their injury (World Health Organization, 2015). Injuries can have a major impact on the quality of life of a crash survivor and their relatives and also pose a burden to society.

Increasingly, policy makers are adopting the number of serious injuries as an additional indicator of road safety. Reducing the number of serious traffic injuries is one of the key priorities in the road safety programme 2011-2020 of the European Commission (European Commission, 2010).

Serious injuries are very diverse in nature and their impact can also vary considerably. In some cases, casualties fully recover from their injuries, whereas in other cases people remain permanently disabled. Thus, injuries caused by road crashes can have a major impact on the quality of personal, social and professional life of a crash survivor. Besides these individual consequences, road traffic injuries can have drastic consequences on the life and functioning of the casualties' close social network of family members and relatives.

In 1997, the European Federation of Road Crash Victims (FEVR) in collaboration with the European Commission, undertook an enquiry in order to determine the causes of the substantial drop in both quality and standard of living for victims. The purpose of this study was to promote legislative improvement in favour of road victims. Amongst others, this study showed that crashes had drastic consequences on various aspects of victims' lives but also on their relatives' lives - e.g. 85% of the families of injured victims reported a significant permanent decline in their quality of life (Fédération Européenne des Victimes de la Route, 1997).

Despite the significant decrease in both road traffic fatalities and non-fatal injuries over the last twenty years in Europe (e.g. 59.400 fatalities across Europe in 1996 against 26.000 in 2015; European Commission, 2016a) little is known about the consequences of crashes for the persons concerned. Also, much remains to be done to identify the factors and mechanisms that may help improve the quality of life for injured persons and their families and to improve public policies.

The MyLAC study ('My Life After the Crash') was initiated – and jointly coordinated by Vias institute and the European Federation of Road Traffic Victims (FEVR) – in order to meet some of these information needs. It is an international retrospective survey which aims to investigate the consequences of road traffic crash injuries from different perspectives, including medical, psychological, social and economic consequences. The survey was translated into 15 languages and was disseminated over a 4 month period (mid-May until mid-September 2016) in 20 EU countries with the collaboration of local partners in each participating country (e.g. road casualties' associations, medical/trauma patient associations, road/road safety organisations with a focus on casualties support or on post-crash response).

The current report presents the main results of the study – including analyses at both European and national levels (with comparisons between some countries/regions).

1.2. Dimensions considered in the report

A general framework for discussing health impacts for individuals is provided by the ICF model, the International Classification of Functioning, Disability and Health (World Health Organization, 2002).

According to this model (Figure 1), a person's functioning and disability is conceived as a dynamic interaction between the health condition (disorder, disease, injury, trauma, etc.) and contextual factors.

Figure 1 shows the three levels of human functioning used within ICF: (1) the functioning at the level of body or body part (health condition, body function and structure); (2) the whole person (activity); and (3) the whole person in a social context (participation). Key concepts used within the model are disabilities, impairments, activity limitations and participation restrictions:

- *Disabilities* refer to problems on one or more levels of human functioning (body, activity and participation level).
- *Impairments* are defined as problems related to the health condition, such as a significant deviation or loss (for example, paralysis or deafness) (body level).
- *Activity limitations* are described as difficulties an individual may have in executing activities (inability to go for a walk, not being able to answer the phone) (activity level).
- *Participation restrictions* are problems an individual may experience in involvement in life situations (inability to go to work because the office is not accessible to wheelchairs, not being able to join friends for a movie because of a lack of subtitles) (participation level).

Contextual factors cover environmental factors (for example, social attitudes, legal and social structures, climate, terrain) and personal factors, which include for example age, gender, coping styles, social background, profession, and other factors that influence how disability (impairments and limitations) is experienced by the individual.

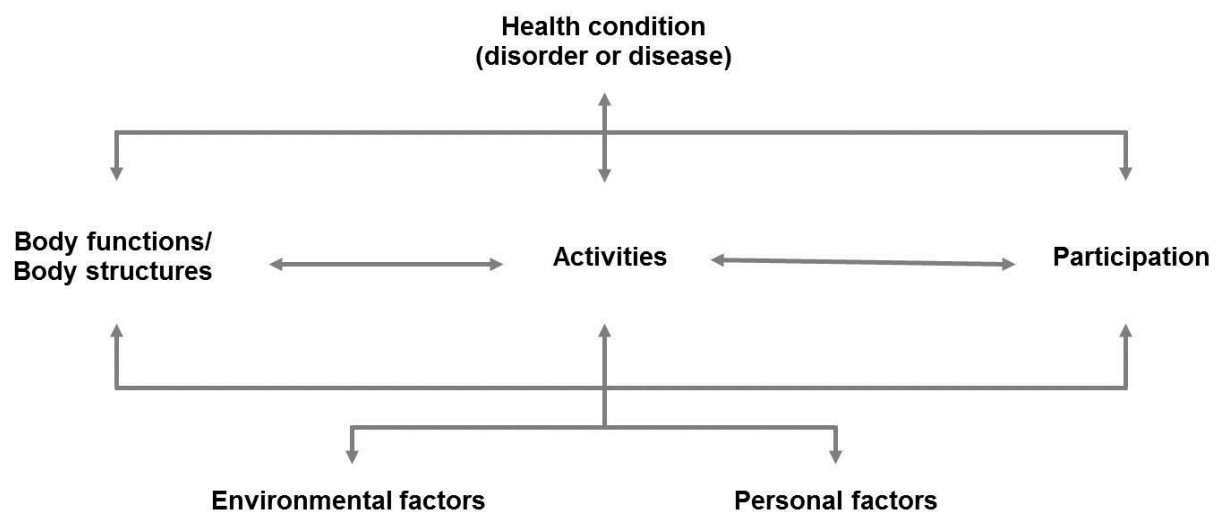


Figure 1. ICF model: interaction between ICF components²

Figure 2 shows an adapted version of the ICF model, now including the dimensions that were considered within MyLAC. Although the ICF models guided our strategy for identifying relevant dimensions to be included in the study, the structure of the current report (see Section 2.2.) did not perfectly match the ICF components but rather remained at the level of more discrete and specific dimensions (e.g. crash circumstances, psychological diagnoses,...). This approach is justified for two reasons. First, most of the existing studies investigating injury consequences remain at the level of strictly defined and circumscribed dimensions rather than providing an overall estimation of the impact on the general health (e.g. impact on activity or participation). Second, many of these specific dimensions may affect several ICF components and may thus be difficult to discuss coherently within this framework (e.g. psychological disorders/distress impact human function at the level of activity but also at the levels of participation and body function/structure). Despite this, all dimensions considered in current study were tentatively put into the ICF general framework and paired with their most closely related ICF components (see Figure 2, for details)

In total, seven specific dimensions are considered in the current report and will be further discussed in the next chapters:

- Circumstances of the crash
- Justice proceedings and insurance claims
- Medical consequences
- Psychological consequences
- Impact on day-to-day, socio-emotional and family life

² Source: <http://www.who.int/classifications/icf/icfbeginnersguide.pdf?ua=1>

- Professional and economic consequences
- Public health

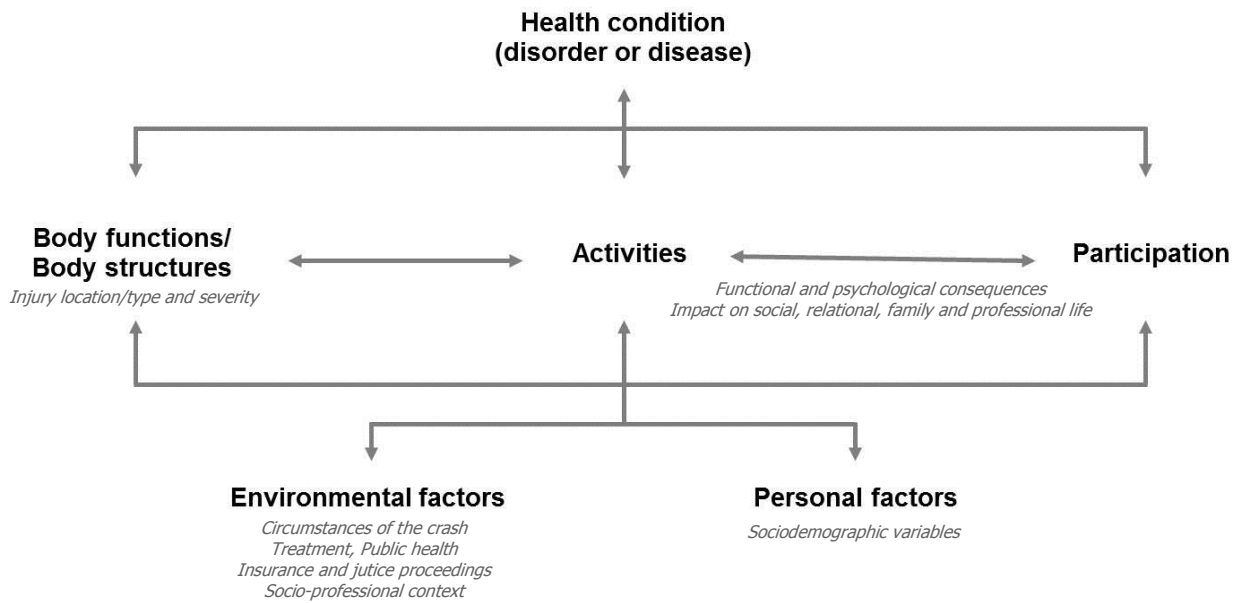


Figure 2. Adapted ICF model with the MyLAC study variables/dimensions

2. Study design and methodology

2.1. Survey preparation and dissemination

The survey was designed and prepared between December 2015 and April 2016. The survey was initially drafted in English and then translated into 15 other languages. With the exception of the translation into Czech language (which was conducted by an independent Czech translator), all other translations were carried out by institutions that had confirmed their intention to take part to the project and to disseminate the survey. Each language version was subsequently double checked either by another partner institution or by a native speaker. Vias institute coordinated the translation processes, centralized all versions and put them online using the online survey software tool QuestionPro®. Table 1 presents the list of the partners that took in charge the translation into foreign languages.

Table 1. Survey translators

Name of association	Country/Region	Survey language
Vias institute	Belgium	English, French, Dutch
European Federation of Road Traffic Victims (FEVR)	EU-wide institution	German
Zavod Varna Pot (ZVP)	Slovenia	Slovenian
Asociación para la Prevención de Accidentes de Tráfico (P(A)T)	Spain	Spanish
Associação de Cidadãos Auto-Mobilizados (ACA-M)	Portugal	Portuguese
Reaction, Youth for the Prevention	Cyprus	Greek
Associazione italiana familiari e vittime della strada (AIFVS)	Italy	Italian
Rådet for Sikker Trafik	Denmark	Danish
Siguranta Auto	Romania	Romanian
Hrvatski Savez Udruga Tjelesnih Invalida (HSUTI)	Croatia	Croatian
Сдружение БАЗК (BAZK)	Bulgaria	Bulgarian
Suat Ayo Trafik Mağdurları Derneği (SATMD)	Turkey	Turkish
Independent translator	Czech Republic	Czech

In total, some forty organisations helped disseminate the survey in 20 EU countries: Belgium, France, Luxembourg, United Kingdom, Ireland, Denmark, Finland, The Netherlands, Germany, Czech Republic, Bulgaria, Romania, Spain, Portugal, Italy, Slovenia, Croatia, Greece, Malta and Cyprus. The survey was also disseminated by institutions in Turkey and Lebanon but unfortunately without success (no data recorded). Table 2 presents the lists of all institutions that took part in the survey dissemination.

Table 2. Lists of the organisations that participated in the dissemination

Institution	Address	Website
International		
European Federation of Road Traffic victims (FEVR)	Haachtsesteenweg/Chaussée de Haecht, 1405, 1130 Brussel/Bruxelles, Belgium	www.fevr.org
Global alliance of NGOs for Road Safety	Erik Eriksens Gade 11, 1th. 2300 Copenhagen S, Denmark	www.roadsafetynegos.org
Belgium		
Rondpunt, VZW	Uitbreidingstraat, 518 bus 2.01. 2600 Berchem, Belgium	www.rondpunt.be
Le Noyau, ASBL	Allée de Clerlande, 6. 1340, Ottignies, Belgium	www.lenoyauasbl.be
Le Ressort, ASBL	Rue Marsannay-la-Côte, 3. 5032 Mazy, Belgium	www.leressort.be
Agence Wallonne pour la Sécurité Routière (AWSR)	Avenue Comte de Smet de Nayer, 14 5000 Namur, Belgium	www.awsr.be
Vias institute	Haachtsesteenweg/Chaussée de Haecht,	www.vias.be

	1405, 1130 Brussel/Bruxelles, Belgium	
Bulgaria		
Сдружение БАЗК (BAZK)/ Bulgarian association of victims in car accidents	Damyan Gruev, 15, ap. 1. 1172 Sofia, Bulgaria	www.bazk.org
фондация Пешеходци/ Foundation Pedestrians	P.O. Box 115. 1172 Sofia, Bulgaria	www.walkersbg.org
Държавно-обществената консултативна комисия по проблемите на безопасността на движението/ State-Public Consultative Commission on the Problems of Road Safety	Shesti Septemvri Str., 29. 1000 Sofia, Bulgaria	www.dokkpbdp.mvr.bg
Czech Republic		
České sdružení obětí dopravních nehod (ČSODN) / The Czech Association of Traffic Accidents Victims	Počátecká, 2/1020, 140 00 Praha 4 – Michle, The Czech Republic	www.csodn.cz
Croatia		
Hrvatski savez udruga tjelesnih invalida (HSUTI)/ Croatian Union of Physically Disabled Persons Associations (CUPDPA)	Šoštarićeva, 8. 10000 Zagreb, Croatia	www.hsuti.hr
Cyprus		
Cyprus Confederation of Organizations of the Disabled (CCOD)	P.O. Box: 23513. 1684 Nicosia, Cyprus	www.kysoa.org.cy
Reaction - Youth for the Prevention	P.O. Box 27982. 2434 Nicosia, Cyprus	www.youthandreaction.com
Denmark		
Rådet for Sikker Trafik	Lersø Parkallé, 111. 2100 København Ø, Denmark	www.sikkertrafik.dk
UlykkesPatientForeningens	Fjeldhammervej, 8. 2610 Rødovre, Denmark	www.ulykkespatient.dk
Germany		
Verkehrsunfall-Opferhilfe Deutschland e.V. (VOD)	Weidenweg, 4. 39291 Hohenwarthe, Germany	www.vod-ev.org
ZNS-Hannelore Kohl Stiftung	Rochusstraße, 24. 53123 Bonn, Germany	www.hannelore-kohl-stiftung.de
Subvenio e.V	Kanzlerstr., 4. 40472 Düsseldorf, Germany	www.subvenio-ev.de
Finland		
Aivovammaliitto	Malminkaari, 5. 700 Helsinki, Finland	www.aivovammaliitto.fi
France		
Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux (IFSTTAR)	Rue Élisée Reclus, 20. 59650 Villeneuve-d'Ascq, France	www.ifsttar.fr
Greece		
SOS Τροχαία Εγκλήματα/SOS Road crimes	Διεύθυνση: Δαφνομήλη, 44. 114 71 Αθήνα, Greece	www.soste.gr
E.Y.ΘY.T.A./EFTHITA	Παπαλουκά. Εξωτερικά Ιατρεία Παλαιού Νοσοκομείου Ρόδου. 85100, Greece	www.efthita-rodos.blogspot.com
Ireland		
Irish Road Victims' Association (IRVA)	Pettitswood, Mullingar, Westmeath. Ireland	www.irva.ie
Headway Brain Injury Services and Support - Ireland	Blackhall Green, Off Blackhall Place. Dublin 7, Ireland	www.headway.ie
Italy		
Associazione italiana familiari e vittime della strada	Via A. Tedeschi, 82. 00157 Roma, Italy	www.vittimestrada.org
Fondazione Luigi Guccione	Via Flaminia, 1060. 00198 Roma, Italy	www.flg.it
Lebanon		
Youth Association for Social Awareness (YASA)	P.O.Box: 45-083, 2nd Floor, Akl Bldg, St. Rock Street. Hazmieh, Lebanon	www.yasa.org
Luxembourg		
Tricentenaire asbl	Rue de la Gare, 1. 7228 Walferdange,	www.tricentenaire.lu

	Luxembourg	
Info Handicap	Avenue de la Gare, 65. 1611 Luxembourg, Luxembourg	www.info-handicap.lu
Malta		
Kummissjoni għad-Drittijiet ta' Persuni b'Diżabilità (CRPD)/ Commission for the Rights of Persons with Disability	Bugeia Institute, Braille Street 1619 Santa Venera SVR, Malta	www.crpdpd.org.mt
The Netherlands		
Slachtofferhulp Nederland	Pallas Athenedreef, 27. 3561 PE Utrecht, The Netherlands	www.slachtofferhulp.nl
Fonds slachtofferhulp	Louis Couperusplein, 2. 2514 HP Den Haag, The Netherlands	www.fondsslachtofferhulp.nl
Portugal		
Associação de Cidadãos Auto-Mobilizados (ACA-M)	Av. 5 de Outubro, 142 – R/C Esquerdo. 1050-061 Lisboa, Portugal	www.aca-m.org
Associação Portuguesa de Deficientes	Largo do Rato, 1-B. 1250-185. Lisboa, Portugal	www.apd.org.pt
Romania		
Siguranta-auto	Strada Secuilor Nr.3, Bloc B27, Scara 3, Etaj 3, Ap.41, Sector 4. 041511 București, Romania	www.siguranta-auto.org.ro
Slovenia		
Zavod Varna Pot (ZVP)/ Safe Journey Institute	Linhartova, 51. 1000 Ljubljana, Slovenia	www.varna-pot.si
Spain		
Asociación de Prevención de Accidentes de Tráfico (P(A)T)	C/ Diputación , 211 entlo. 08011 Barcelona, Spain	www.pat-apat.org
Turkey		
Suat Ayöz Trafik Mağdurları Derneği (SATDM)/Suat Ayöz Traffic Victims Associations	Eminalişa Caddesi, Yeni Fidan Sokak, 2/1. Suadiye-İstanbul, Turkey	www.trafikmagduru.com
United Kingdom		
Aspire – supporting people with spinal injury	Wood Lane, HA7 4AP Stanmore, United Kingdom	www.aspire.org.uk
Scotland's Campaign against Irresponsible Drivers (SCID)	N.C.	www.scid.org.uk
Brake - the road safety charity	P.O. Box 548. HD1 2XZ Huddersfield, United Kingdom	www.brake.org.uk

Advice and instructions were provided to all participating organisations regarding how to disseminate the survey (e.g. using as many communication channels as possible: websites, Facebook pages, newsletters, direct contact with members, etc.). Yet all organisations were free to organise the dissemination activities the way they wanted, taking into account, amongst other things, their resources and possibilities. Considerable differences were noted across countries/organisations regarding the resources and efforts dedicated to the survey dissemination. A substantial number of the partner organisations opted for a rather passive dissemination strategy (e.g. post on website or on Facebook page). However, a number of partners choose for a more active/proactive strategy - e.g. contacting victims/members personally (Agence Wallone pour la Sécurité Routière, Belgium) or even paying for survey participation (Rådet for Sikker Trafik, Denmark). As a result of these very different approaches, survey participation differed widely across countries (see Section 2.3., for further details).

With this respect, we cannot exclude that the way through which institutions have contacted/reached respondents and the nature of their requests might have had an impact on the selection process (e.g. financial compensation in the Danish sample may have encouraged some – probably less seriously injured - victims who would not have completed the survey otherwise). This potential bias will be further discussed at a later stage in this report (see Section 4.3.).

Please note that also an association from India showed interest in the study but after the dissemination. They undertook the survey in India at a later stage. Results about the Indian data are not included in this report but will be published at a later stage in another report.

2.2. Topics and instruments included in the survey

The questionnaire consisted of 90 items. At the beginning of the survey, a number of socio-demographic variables were gathered from the respondents: gender, age, age at time of the crash, time elapsed since the crash. The core of the survey consisted of seven groups of questions in order to cover the different dimensions considered in the current report:

Circumstances of the crash

- Crash location: rural zone, urban zone and motorway;
- Time of the crash in terms of weekdays (weekday vs. weekend) and time of the day (daytime vs. night-time);
- Causal human- (on both victims' and/or opponent's sides) and non-human factors;
- Implication of other road users/vehicles in the crash.

Justice proceedings and insurance claims

- At-fault or no-fault crash;
- Court involvement;
- Fairness of charge and sentence;
- Seeing justice done;
- Length of proceedings and satisfaction about proceeding length;
- Compensation insurance and satisfaction with compensation.

Medical consequences

- Severity (including length of hospital stay and vital/non-vital prognosis);
- Number of injuries sustained;
- Full recovery;
- Injury type and location: the 39 EUROCAST injury groups (Polinder, 2007) - submitted as a self-report questionnaire to the respondents - merged into the 6 broader categories : Head, face, abdominal and thoracic, Vertebral and spinal, upper extremities, lower extremities and other type injuries;
- Functional health: EQ-6D (R. Brooks & The EuroQol Group, 1996; Hoeymans, Van Lindert, & Westert, 2005; The EuroQol Group, 1990): Mobility, self-care, usual activity, pain, mental health and cognitive functioning.

Psychological consequences

- Post-traumatic stress disorder (PTSD): Post-traumatic checklist - Specific (PCL-S) 6-items short form (Lang et al., 2012; Weathers, Litz, Herman, Huska, & Keane, 1993). Items are rated on a 5 point-Likert scale. Total scores can range from a low of 6 to a high of 30 and scores of 14 or higher are indicative of PTSD diagnostic (see Lang et al., 2012, for details);
- Anxiety disorder and Major depression: Hospital Anxiety and Depression Scale HADS (HADS, Zigmond & Snaith, 1983). Items are rated on a 5 point-Likert scale. For the two subscales (7 items each), scores can range from a low of 0 to a high of 21 and scores of 11 or higher are indicative of diagnostic.

Impact on day-to-day, socio-emotional and family life

- Consequences for socio-emotional life and for taking care of own responsibilities (regarding household and work/studies): 5 items taken from the subscales 'getting along with people' and 'life activities' of the WHODAS 2.0, 36-items version (Üstün et al., 2010) and 3 items newly developed³;
- Impact on family/household life and functioning (1 items)⁴;
- Impact on relatives' personal (3 items) and professional life (3 items)⁵;

³ As we used both existing and newly developed items, factor analysis - using oblimin rotation - was conducted in order to assess the measurement validity of the underlying factors. The two factors that emerged explained 74.64 % of the variance - with high loadings for all items and no cross-loading between the factors - and showed good reliability: socio-emotional life (6 items, $\alpha = .92$) and taking care of own responsibilities (2 items, $\alpha = .81$). Socio-emotional life items: Communicating with people, Maintaining friendships, Making new friends, Intimate relationships, Sexual activities, Dealing with people you don't know (1: No difficulty at all – 5: Extreme or cannot do). Taking care of own responsibilities items : Taking care of your household responsibilities, Doing your day-to-day work/school (1: No difficulty at all – 5: Extreme or cannot do).

⁴ "To what extent has the crash impacted on your family/household life and functioning ?" (1: No impact at all – 5: Extremely).

- Impact on living situation.

Professional and economic consequences

- Time off work/studies after the crash;
- Special adaptation(s) needed for getting back to work/studies;
- Financial income decrease;

Public health

- Estimated quality of medical treatment, social and mental health services and technical/logistic help;
- Satisfaction with social security financial help for medical treatment, social and mental health services and technical/logistic help;
- Satisfaction with access and use of public places and with public transport.

Most study dimensions were analysed at the level of the total sample (Section 3.1.), but some also at the level of some specific regions (Section 3.2.). The following dimensions were investigated at both sample levels: a. Circumstances of the crash; b. Justice proceedings and insurance claims; c. Psychological consequences; d. Impact on day-to-day, socio-emotional and family life; e. Professional and economic consequences. Since public health policies are specific to particular regions/countries, questions relating to these aspects were not considered in the total sample analyses. On the contrary, medical consequences of traffic crashes are not likely to differ as a function of one particular region/country and were therefore only considered in the total sample analyses.

2.3. Participants included in the study

Out of the 830 participants who started filling in the survey, 75 completed the first survey page only (socio-demographic data). These were considered as providing insufficient information for being included in the analyses. From the remaining 755 subjects, 208 did not complete the survey until the end but were nonetheless included in the analyses as they provided partially exploitable information.

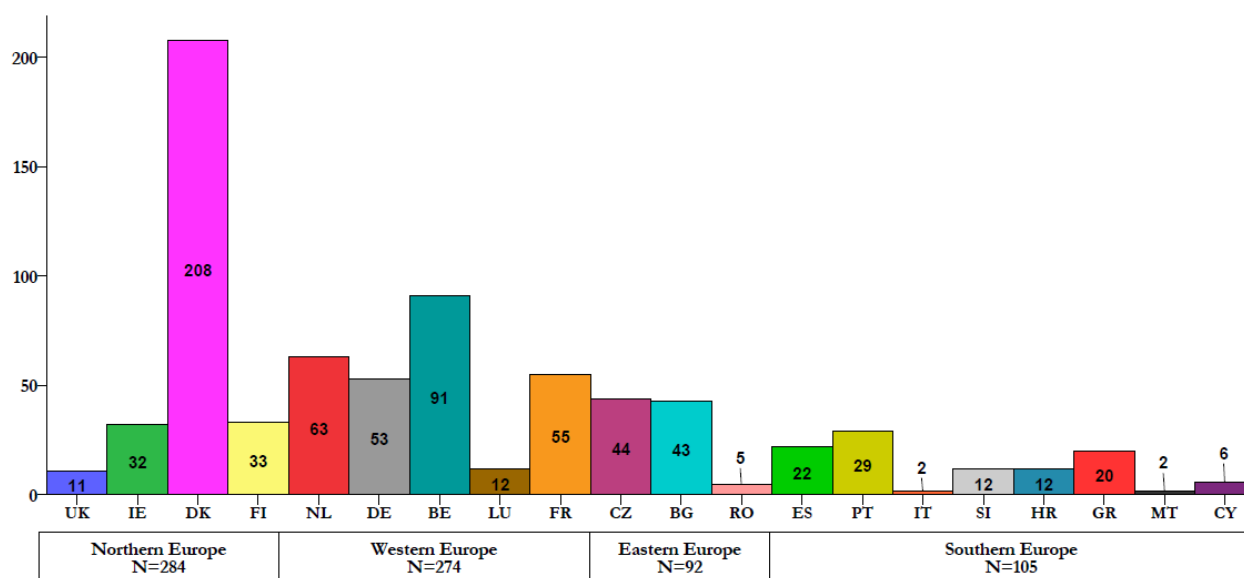


Figure 3. Sample sizes by countries and regions

The sample size widely differs across participating countries (see Figure 3. and 4) because of differences between partners regarding, for example, the resources and time dedicated to the survey, the size of the organisation, its implementation and visibility, the type of target audience, the quality of contact with members/affiliates, the dissemination/communication channel(s), etc.

⁵ Items were formulated as followed: "At least one of your relatives had to... to take care of you". Three items taps on professional life ("adapt work", "stop working", "alter career aspirations") and the three other on personal life ("adapt day-to-day life", "alter (reduce) social life" and "restrict emotional life")

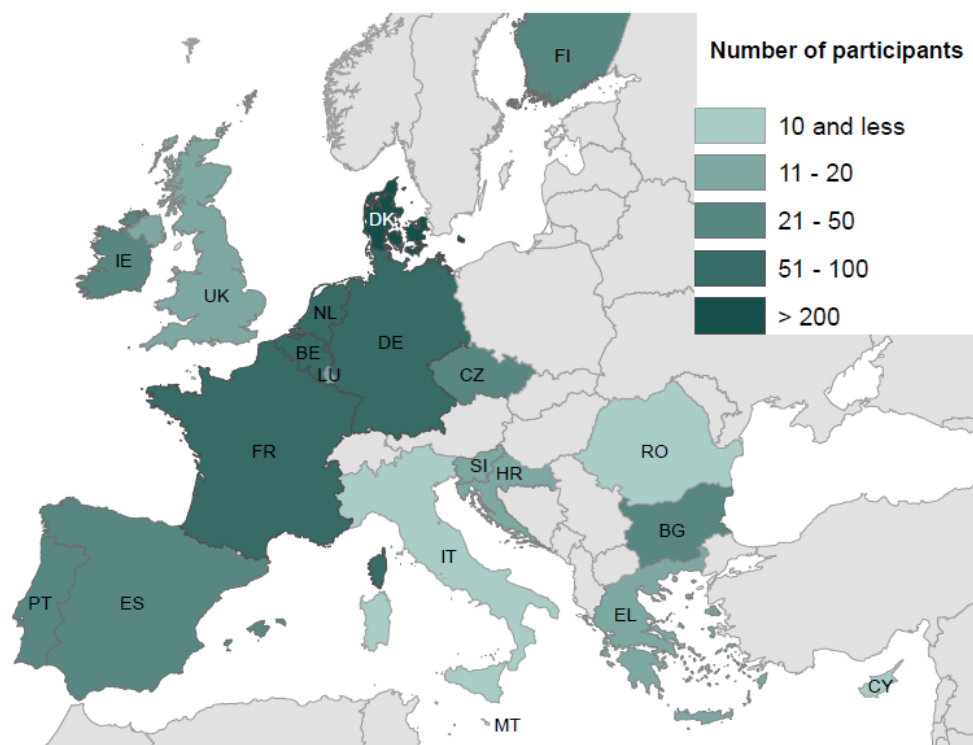


Figure 4. Map illustrating sample sizes by countries

* Note. ES: Spain ; PT: Portugal ; FR : France ; BE: Belgium ; NL: The Netherlands ; LU: Luxembourg ; DE: Germany ; DK: Denmark ; UK: United Kingdom ; IE: Ireland ; CZ: The Czech Republic ; IT: Italy ; SI: Slovenia ; HR: Croatia ; MT: Malta ; CY: Cyprus ; GR: Greece ; RO: Romania ; BG : Bulgaria ; FI : Finland.

The absolute numbers of respondents were the largest in Denmark, Belgium, France, the Netherlands and Germany (reaching at least 50). However, a different ranking emerges when comparing the samples with the population size (See Figure 5). Denmark and Luxembourg come first (more than 10 respondents per million inhabitants) followed by Belgium, Bulgaria, Cyprus, Finland, Ireland and Slovenia (between 5 and 10 respondents per millions inhabitants).

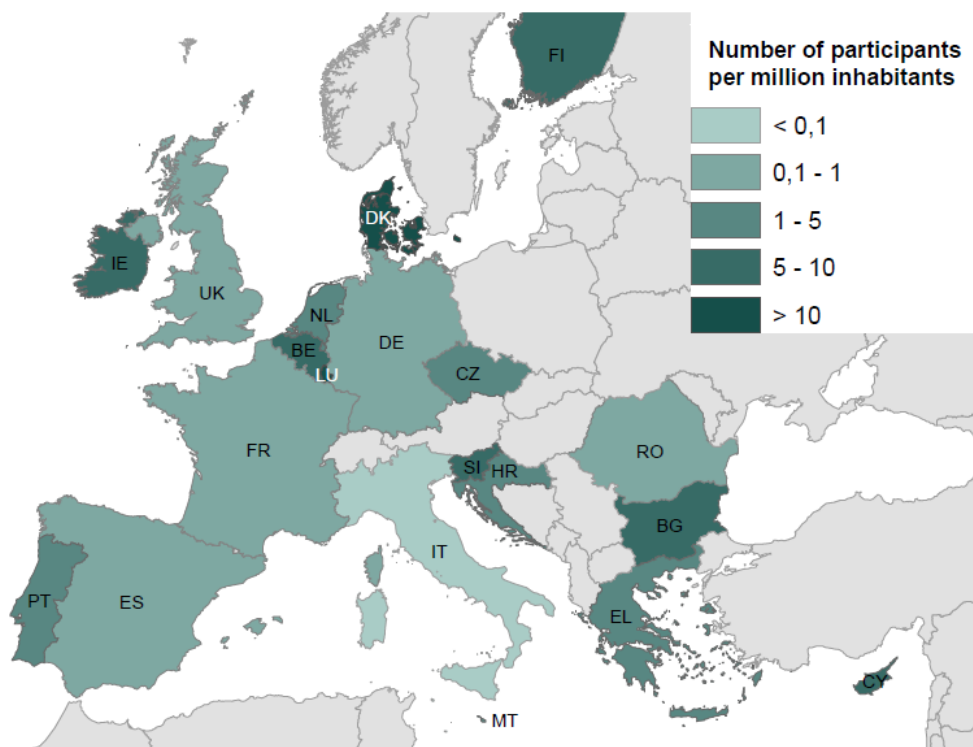


Figure 5. Map illustrating relative sample sizes by countries (per million inhabitants)

* Note. ES: Spain ; PT: Portugal ; FR: France ; BE: Belgium ; NL: The Netherlands ; LU: Luxembourg ; DE: Germany ; DK: Denmark ; UK: United Kingdom ; IE: Ireland ; CZ: The Czech Republic ; IT: Italy ; SI: Slovenia ; HR: Croatia ; MT: Malta ; CY: Cyprus ; GR: Greece ; RO: Romania ; BG : Bulgaria ; FI : Finland.

Of course, our sample sizes were negligible when compared with the real prevalence of road traffic injuries. As an indication, recent figures presented by the European Commission give an estimation of 51.5 road fatalities and about 266 road serious injuries per one million inhabitants in 2014 (European Commission, 2016a) – with the total number of road traffic injuries (including slight and moderated injuries) recognised to be much larger (estimation of 2015 per million inhabitants in 2014, European Commission, 2016b) although even these figures are underestimated because of underreporting of crashes to the police.

The total sample composition regarding gender, age, age at the time of the crash, time elapsed since the crash and road user category is presented in Table 3. A small majority of the sample were female (about 55%) which is different from the real female involvement in road traffic collisions, which is smaller than that of men (see Peden et al., 2004 for further details). While most of the respondents were aged between 26 and 65, a vast majority of them were younger than 46 suggesting a non-recent crash for a substantial part of the sample. This is indeed revealed by the time elapsed since the crash as reported by the victims which was more than one year for over 85% of respondents). Finally, passengers of four-wheelers were overrepresented (about 60%) compared to the other road user categories (about 10-15% for the other categories). Available crash statistics (see e.g. World Health Organization, 2009, for detailed national data in the EU zone) typically show relatively lower rates of four-wheelers compared to our sample.

Table 3. Composition of the MyLAC sample

Number of subjects (% of total sample)		
Gender	Female	413 (54.7%)
	Male	342 (45.3%)
Age	25 or less	105 (13.9%)
	26-45	355 (47.0%)
	46-65	266 (35.2%)
	More than 65	29 (3.8%)
Age at time of the crash	25 or less	292 (38.7%)
	26-45	296 (39.2%)
	46-65	149 (19.7%)
	More than 65	18 (2.4%)
Time elapsed since the crash	One year or less	101 (13.4%)
	More than one year	654 (86.6%)
Road user category	Four-wheeler	446 (59.1%)
	Powered two-wheeler	121 (16.0%)
	Cyclist	110 (14.6%)
	Pedestrian	78 (10.3%)

In order to assess the extent of heterogeneity of the sample across regions, the total sample was divided following the four European regions delimited by the United Nations - Northern, Western, Eastern and Southern Europe (see Figure 3, lower part) – and the subsamples were compared regarding gender and age, age at the time of the crash, time elapsed since the crash and road user type categories. No significant difference across regions were observed for the age (at the moment of the survey completion), the age at the time of the crash and the time elapsed since the crash. On the other hand, significant differences in the subsample composition were observed for gender and road user category. Northern and Eastern Europe showed a higher proportion of female traffic victims (respectively 61.3% and 60.9%) against 50% for Western Europe and 43.8% for Southern Europe. Regarding road user prevalence, Eastern Europe showed the highest proportion of four-wheelers (77.2%) as compared to the other region (68.6%, 59.1% and 49.6% respectively for Southern, Western and Northern Europe. However, disparity in road user prevalence may not be regarded as a lack of representativeness considering the clear differences recognised in transport habits across regions/countries (World Health Organization, 2009). Altogether, results suggest that the sample was quite homogeneous across regions.

Although we acknowledge that our sample is somewhat biased and has several limitations, the relative homogeneity of the samples across European sub-regions and its overall size were considered to be sufficient to undertake overall analyses and to allow comparisons (e.g. between road user categories) on the topics covered by the survey.

2.4. Data Analysis

The focus of the data analysis presented in this report is on differences in the consequences of road traffic injuries by **transport mode** and **severity level**.

For transport modes, 4 categories were used: Cars, powered two-wheelers (mopeds and motorcycles), cyclists, and pedestrians.

Because the study relied on self-reported data by the injured people, standard severity measurement for injuries such as AIS or ISS scores were not available. However, an aggregated measure of injury severity was computed based on two underlying indicators of severity: the length of the hospital stay and the fact that the vital prognosis was engaged or not⁶ (based on self-report). The severity score was dichotomised based on two exclusive conditions: (1) length of hospital stay lasting 7 days or less AND vital prognosis not engaged (Grade I severity ; 39.5% of the sample), (2) length of hospital stay lasting more than 7 days OR vital prognosis engaged (Grade II severity ; 60.5% of the sample)⁷.

This clearly indicates that our sample was biased towards more serious injuries as studies and reports suggest that the proportion of slight to moderate injuries is typically much higher (about 15 to 20 times higher) than the proportion of serious injuries (European Commission, 2016b). A possible explanation of the low proportion of the slightly to moderately injured respondents in our sample might be that these victims may no longer have sequelae from their crash (or no longer experience it as a limitation) and hence feel less concerned about this subject.

Analyses of these two groups showed that the proportion of more serious injuries (Grade II) was significantly higher ($p < .005$) in less recent crashes (more than 1 years since crash⁸) than in more recent crashes (one year or less⁷) suggesting a potential confounding effect between recency and severity dimensions and, consequently, potential biases. However, as the proportion of recent vs. less recent crashes were the same across road user categories (as assessed by a non-significant chi-squared test), these potential biases were implicitly and partially controlled for. Indeed, as comparisons between road user categories are based on the same proportion of recent vs. less recent crashes in each road user category, the potential interference between these two aspects is limited.

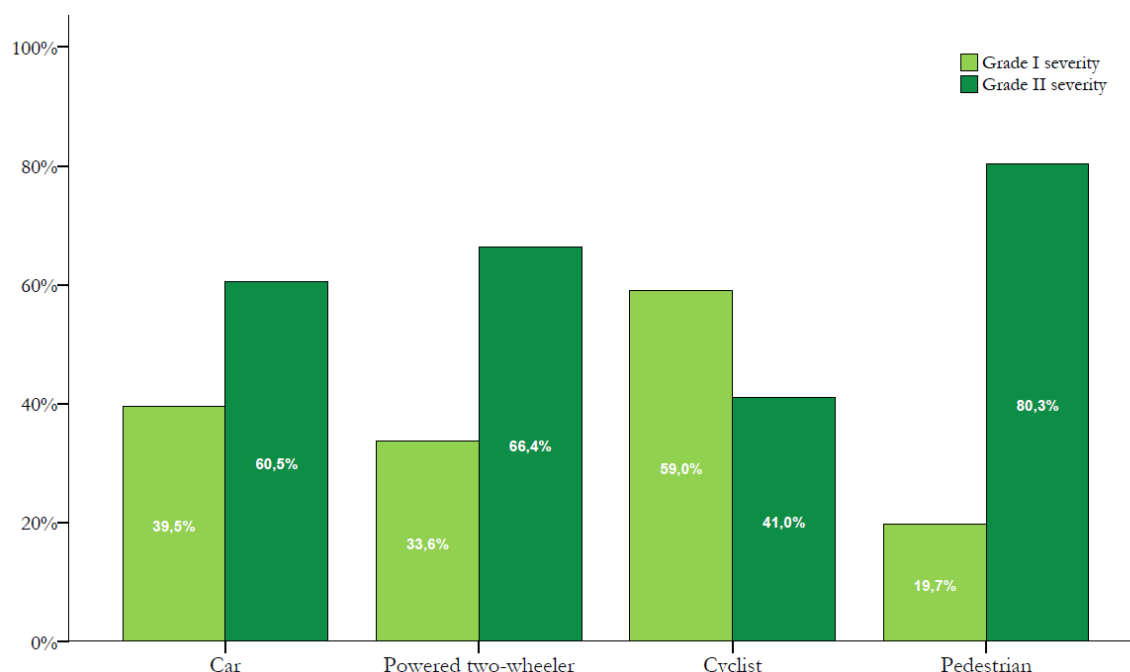


Figure 6. Proportion of Grade I vs. Grade II severity injuries as a function of the road user categories

⁶ Standard severity score, such as AIS or ISS, are indeed implicitly based on four criteria: threat of life, permanent impairment, treatment period and energy dissipation (O'Keefe & Jurkovich, 2001).

⁷ The terms Grade I vs. Grade II severity were preferred to the distinction serious vs. non-serious injury in order to avoid confusion – and erroneous comparisons – with other studies using standard injury severity scores (e.g. AIS, ISS).

⁸ A one year time period since the crash was used as cutoff for distinguishing between recent vs. less recent crash. This is in accordance with existing literature that suggests that, in general, recovery from physical and functional limitations in general trauma populations reaches a plateau at about 12 months (Ameratunga, Norton, Bennett, & Jackson, 2004).

Figure 6 shows the proportions of road user categories as a function of injury severity. The proportion of Grade II severity was highest for pedestrians (about 80%) followed by four-wheelers and powered two-wheelers (about 60%) and was twice as high as for cyclists (40%).

While representativeness of the sample may not be guaranteed, results from our sample (with the exception of cyclists) are nonetheless in line with previous findings suggesting that consequence of injuries are usually more serious for vulnerable road users (Peden et al., 2004).

3. Main Results

3.1. Results for the total sample

3.1.1. Circumstances of the crash

Figure 7 presents the sample distribution as a function of the time (in terms of weekday and time of the day) and location (type of area). For a vast majority of the victims (about 80%), the crash occurred during daytime (about 80% with about 60% during the week and 20% during the weekend).

The proportion of crashes that occurred at night were higher ($p < .005$) for four-wheelers (24.2%) and for pedestrians (19.2%) as compared to two-wheelers (10.8% for powered two-wheelers and 11.8% for cyclists).

In terms of location most of the crashes occurred in urban or suburban zones (about 65%) followed by rural zones (about 25%) and motorways (15%). This picture is quite different from the current European situation as reported by the European Commission in its Annual Accident Report 2016 with a majority of crashes occurring in rural areas - 67% for 2014 data against 27% in urban areas and 6% in motorway (European Commission, 2016a).

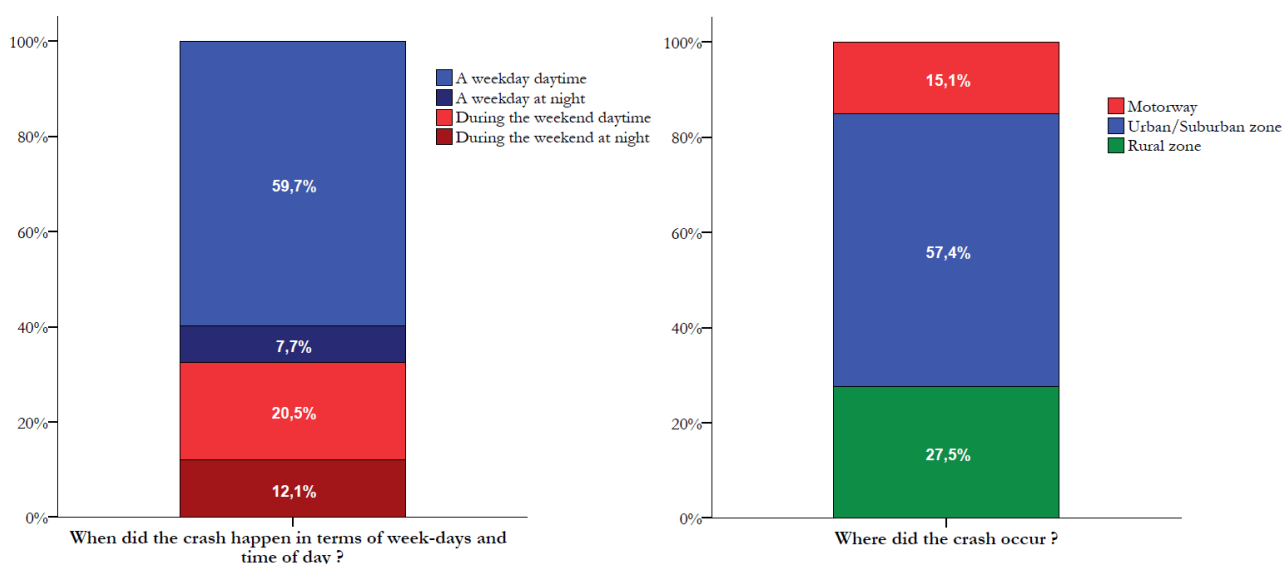


Figure 7. Distribution of the sample as a function of the time of the crash and its location

A vast majority of the respondents reported that another motorised vehicle was involved in the crash (80.4%). 15.6% reported that no other road users were involved and another 4.0% reported the implication of a non-motorized road user. Vulnerable road user reported the implication of a motorised vehicle in 9 out of 10 cases while the remaining tenth reported the implication of a non-motorised vehicle (i.e. typically a bike).

As for the motorised road users, the implication of another motorised vehicle was reported in 77.6% of the cases; 17.7% reported that no other road user was involved and 1.3% reported the implication of vulnerable road user.

Respondents were also asked about factors that had contributed to the crash. As shown in Figure 8, only about one quarter of the sample reported that their personal behaviour or other own characteristics (human factors such as mood, mental state, substance use,...) may have contributed to the crash. However, human factors on the opponent's side were reported in 80% of the case where another road user was involved in the crash. Non-human causal factors (e.g. atmospheric conditions, car failure, road conditions/infrastructure) were mentioned in 40% of the cases.

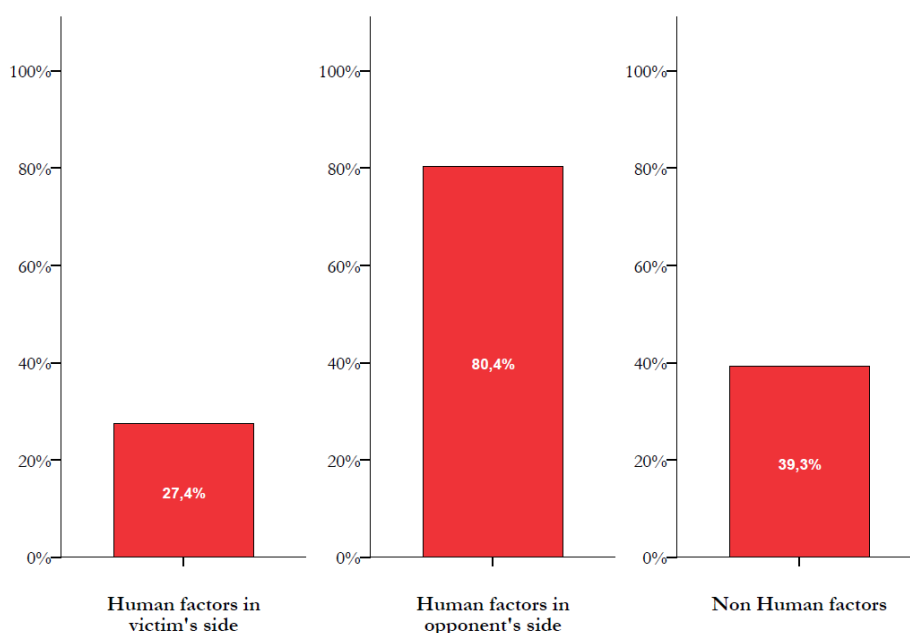


Figure 8. Prevalence of human and non-human factors evoked in crash causation

The most frequently mentioned human causal factors in the victims' own side were inattention/distraction (9.7%), inappropriate driving behaviour (8.3%) and fatigue (7.9%). As for the opponent, the two most reported human factors were inappropriate driving behaviour (49.8%) inattention/distraction (43.0%) with alcohol consumption and lack of experience also being substantial but much less frequent (around 16.6% and 16.5% respectively). The most commonly reported non-human factors were road conditions/infrastructure (18.7%) followed by atmospheric conditions (13.4%), unexpected obstacles (11.7%) and car failure (5.6%)(see Table 4).

Table 4. Prevalence of human and non-human factors evoked in crash causation

Human factors	Victim's side	Opponent's side
Alcohol	5.3%	16.6%
Drugs	1.5%	4.7%
Other psychotropic products : medication	0.5%	2.7%
Fatigue	7.9%	9.3%
Stress	6.0%	7.8%
Inattention/distraction	9.7%	43.0%
Lack of experience	8.3%	16.5%
Inappropriate driving behaviour	5.6%	49.8%
Non-human factors		
Road conditions/Infrastructure	18.7%	
Atmospheric conditions	13.4%	
Unexpected obstacle	11.7%	
Car failure	5.6%	

3.1.2. Justice proceedings and insurance claims

The vast majority of the respondents declared that they had not been considered at fault for the crash (78.1%). 14.2% had been considered totally at fault and 7.7% partially at fault.

Those being not at fault were asked several questions about the justice proceedings. Of them, 44.3% reported that their case had gone to court. As for the proceedings, 30.0% reported proceedings of one year or less, 30.0% proceedings that lasted between 1 and 3 years and even 39.9% proceedings lasting more than 3 years. As a corollary, two thirds of the sample (66.0%) considered the length of the proceedings to be unacceptably long. These results are in line with a study conducted by the European Federation of Road

Traffic Victims (Fédération Européenne des Victimes de la Route, 1997) which showed that the average length of proceedings (for seriously injured traffic victims) was 4 years.

The feelings of the respondents about the outcomes of the proceedings were mixed. Only 44.6% of the respondents were of the opinion that the sentence was fair and 47.7% considered that justice was done in their case. The results give however a somewhat better picture than the previous inquiry conducted by the European Federation of Road Traffic Victims (Fédération Européenne des Victimes de la Route, 1997). Indeed, previous results showed that 39% considered that the charges were fair and only 32% considered that justice was done in their case. The comparison with our results must however be treated with caution as the former study included both injured victims and relatives of deceased victims and the respective proportion of the two groups was not mentioned. With this respect, the more negative results of the 1997's study might be explained by the fact that the justice system responds better to road crash cases today than twenty years ago. An alternative explanation might be that the contribution of victims' relatives' opinions in the former study have negatively influenced the results as the relatives may have an even more strong feeling of injustice than the victims themselves.

Questions about insurance claims were also asked to those that reported not having been considered at fault. About one half reported being somewhat or completely unsatisfied with the compensation they received (47.4%). 35.1% reported that they received no compensation for neither injuries nor pain or suffering. Surprisingly maybe, this picture was quite similar for less seriously injured (42.1% Grade I severity report no compensation) and for seriously injured (30.1% Grade II severity).

3.1.3. Medical consequences

Table 5 gives the average number of body regions impacted and the distribution of injuries by body region. Figures are provided for each transport mode and for seriously as well as less seriously injured casualties.

Table 5. Average number of body regions impacted and proportion of injuries reported – by location – for each road user category and as a function of injury severity

N=660	Car occupant	PTW	Cyclist	Pedestrian		Grade I severity	Grade II severity	
Average # of body regions impacted	2.33	2.02	2.11	2.47	<i>n.s.</i>	1.84	3.07	<i>p < .001</i>
Head	80.3%	37.2%	60.9%	62.8%	<i>p < .001</i>	46.4%	70.4%	<i>p < .001</i>
Face	22.9%	10.7%	20.9%	28.2%	<i>p < .05</i>	11.5%	32.6%	<i>p < .001</i>
Abdominal and thoracic	28.3%	25.6%	14.5%	24.4%	<i>p < .05</i>	9.2%	42.1%	<i>p < .001</i>
Vertebral and spinal	52.9%	32.2%	35.5%	35.9%	<i>p < .001</i>	50.6%	52.6%	<i>n.s.</i>
Upper extremities	39.0%	47.1%	43.6%	41.0%	<i>n.s.</i>	39.1%	52.4%	<i>p < .001</i>
Lower extremities	35.7%	48.8%	35.5%	55.1%	<i>p < .001</i>	27.6%	57.1%	<i>p < .001</i>
Other	56.5%	56.2%	75.5%	61.5%	<i>p < .005</i>	62.8%	71.9%	<i>p < .005</i>

Note. PTW: Powered two-wheeler

The average number of body regions impacted was 2.26. There were only small differences between road user categories for this number. The number of body regions impacted was however almost twice as high for seriously injured victims (3.07) as for less seriously injured (1.84).

Significant differences in the distribution of injuries by body region were found for all locations except for upper extremities injuries. The three most frequently incurred locations for injuries were vertebral/spine and head injuries for the less seriously impaired group (Grade I) and head and lower extremities injuries for the most seriously injured group (Grade II). With the exception of vertebral and spinal injuries, an increased severity (Grade II vs. Grade I) was associated with a higher prevalence of each type of injury, with the most noticeable differences observed for abdominal and thoracic injuries (+32.9%), lower extremities injuries (+29.5%), head injuries (+24.0%) and face injuries (+21.1%). As for the road user categories, four-wheelers most frequently suffered from head and vertebral/spinal injuries, powered two-wheelers from upper and lower extremities injuries, cyclists from head and upper extremities injuries and pedestrians from head and lower extremities injuries.

The number of injuries and the percentage of people fully recovering can also be considered as indicators of the medical consequences (Table 6).

Table 6. Number of injuries sustained and prevalence of full recovery as a function of injury severity.

N=660	Grade I severity	Grade II severity	
Number of injuries	3.5	6.5	$p < .001$
Full recovery	52.5%	21.6%	$p < .001$

Overall, the average number of injuries sustained by the victims was 5,34. Only about a third of the respondents reported full recovery (33.8%). These results have been examined as a function of the road user category and of the severity. Only for injury severity were significant differences found suggesting that the more seriously injured victims report twice as many injuries as less seriously injured victims and report full recovery in only one fifth of cases (as compared to more than 50% of full recovery in the less seriously injured group). This again illustrates that our sample is biased toward more serious injuries and outcomes. Indeed, three recent national representative studies – including all levels of injury severity (based, for example, on insurance data) – found that the rates of victims sustaining a permanent medical impairment of at least 1% (PMI1+) yielded at around 11-12% (respectively 11.1% in Berg, Ifver, & Hasselberg, 2016; 11.2% in Malm, Krafft, Kullgren, Ydenius, & Tingvall, 2008; and 11.8% in Stigson, Gustafsson, Sunnevang, Krafft, & Kullgren, 2015).

The functional loss was estimated by subtracting the scores of 6 functional dimensions (Mobility, Self-care, Usual activity, Pain, Mental health, Cognitive functioning) at one month after the crash from the scores of the same dimension prior to the crash (rated on a 5 point Likert scale ranging from extreme problems/unable to (1 – corresponding to 0% functionality) to no problem (5 – corresponding to 100% functionality). Overall, the functional loss was highest for the usual/day-to-day activity dimension (-2.83/-70.8% for the total sample) followed by pain (2.64/66.0%), mobility (-2.44/-61.0%), self-care (-2.23/-55.8%), cognitive functioning (-2.06/-51.5%) and mental health (-1.66/-41.5%). While the functional loss for less seriously injured casualties (Grade I) was predominantly observable for two dimensions (usual activity and pain with a functional loss of about 2 units/50%), for the more seriously impacted injured (Grade II) four dimensions were specifically impacted: usual activity, mobility, pain and self-care (with a functional loss of about 3 units/75%). This is in line with previous research suggesting that the most commonly reported complaints reported after a crash injury are limitations of daily activities and pain/discomfort (e.g. Hours et al., 2013; Nhac-Vu et al., 2011; Weijermars, Stipdonk, Aarts, Bos, & Wijnen, 2014; Weijermars, Wijnen, Bos, & Wijnhuizen, 2014).

Two-way ANOVAs were conducted for exploring differences in functional scores as a function of both severity and transport mode (see Table 7).

Table 7. Functional loss⁹ one month after the crash – as compared to the pre-crash situation – based on EQ-6D scores and as a function of injury severity.

N=639	Grade I severity	Grade II severity	
Mobility	-1.47 (36.9%)	-3.07 (76.8%)	$p < .001$
Self-care	-1.14 (28.4%)	-2.93 (73.3%)	$p < .001$
Usual activity	-2.03 (50.7%)	-3.35 (83.6%)	$p < .001$
Pain¹⁰	2.06 (51.5%)	3.01 (75.3%)	$p < .001$
Mental health	-1.08 (26.9%)	-2.04 (51.0%)	$p < .001$
Cognitive functioning	-1.30 (32.57%)	-2.56 (63.9%)	$p < .001$

Significant differences were observed for all EQ-6D scores as a function of severity ($p < .001$). Most of these scores did not differ as a function of the transport mode used at the moment of the crash. The only exception concerns the Usual activity scale ($p < .05$) and the Cognitive functioning scale ($p < .01$). For Usual activity, subsequent tests¹¹ showed that pedestrians had an increased functional loss compared to four-wheelers (.43 corresponding to 10.8%).

For the significant main effect of the road user category on the cognitive scale, subsequent tests showed that powered two-wheelers reported less functional loss compared to car occupants (-.40 or -10.0%) and

⁹ Functional lost was calculated by making the difference between the ED-6Q scores before the crash and one month after the crash (as rated retrospectively by the respondents). ED-6Q scores are rated on a 5 points likert scale (0. No/No problem – 4. Unable to/Extreme problem). Difference scores are expressed both in the original scale and as converted in percentage (the 0-4 scale being converted into a 0%-100% scale).

¹⁰ Difference score for pain was reverted for reflecting increased difficulties (increased pain).

¹¹ Post hoc tests using Least Squared Difference (LSD)

pedestrians (-.75 or 18.8%). These results are partially consistent with existing literature which suggest that pedestrians and powered two-wheelers often reported the most serious functional outcomes – in particular for physical problems and functional limitations (Mayou & Bryant, 2003; Weijermars, Bos, & Stipdonk, 2016; Weijermars, Stipdonk, et al., 2014) while, to the best of our knowledge, no previous study showed transport mode specific differences regarding cognitive functioning.

Additional analyses further revealed that the increased functional loss of seriously injured victims – as compared to less seriously injured victims – was higher for motorized vehicles (four-wheelers and powered two-wheelers) than for vulnerable road-users (cyclists and pedestrians).

3.1.4. Psychological consequences

A substantial part of the respondents reported having experienced psychological disorders one month after the crash (as retrospectively reported at the time of the survey completion). Post-traumatic disorder was the most frequently reported disorder (62.2% of the total sample reaching diagnostic criteria as assessed by the Post-traumatic checklist – Specific, PCL-S, Lang et al., 2012; Weathers et al., 1993) followed by major depression (57.1%) and anxiety disorder (46.0%) - as assessed by the Hospital Anxiety and Depression Scale (HAD scale, Zigmond & Snaith, 1983). This result is consistent with other studies that have shown that PTSD is one of the most prevalent categories of mental illness, with road traffic crashes emerging as the single leading civilian cause of PTSD (Blanchard & Hickling, 1997). While PTSD was found to be the most frequent disorder among the less seriously injured casualties (61% against 38% for anxiety disorder and major depression), the three types of disorders were reported by the majority of the more seriously injured casualties (64% for major depression and PTSD and 51% for anxiety disorder).

It important to note that our psychological measures are well-established but tap into the victims' subjective experience – due to the self-reporting nature of the measure - and may therefore not be considered to have the same value as a formal diagnostic undertaken by a professional. Furthermore, while most questionnaires used in mental health provided a threshold for assessing disorders, they are not sufficient for evaluating them reliably and validly (formal evaluation by a clinician is always needed). This may explain why the rates of psychological disorders as reported in the current study appear to be quite high – although strict comparisons with existing research are not possible considering the wide diversity of methodologies used and the high disparity in prevalence rates across studies (Weijermars et al., 2017). For example, an early review of psychiatric morbidity after motor vehicle collisions (Błaszczynski et al., 1998) showed wide variations in prevalence rates for the most commonly reported disorders: depression (21% to 67% across studies), anxiety (4% to 87% across studies), driving phobia (2% to 47% across studies) and Post Traumatic Stress Disorder (PTSD) (0% to 100% across studies).

Chi-squared tests were conducted for exploring differences in prevalence of psychological consequences as a function of both injury severity and transport mode (Table 8).

Table 8. Proportion of respondents reaching the diagnostic threshold for Post-Traumatic Stress Disorder (PTSD), Anxiety disorder and Major depression one month after the crash.

N=618	Grade I severity	Grade II severity	
PTSD	60.7%	63.9%	<i>n.s.</i>
Anxiety disorder	38.1%	50.9%	<i>p < .001</i>
Major depression	38.1%	69.1%	<i>p < .001</i>

The frequency of the 3 types of psychological disorders did not differ significantly as a function of road user category. Similarly, few differences have been identified in the literature concerning the psychological outcomes of crash involvement depending on the type of transport used by the casualty (Peden et al., 2004). Our analyses furthermore showed that the severity affected the frequency of anxiety disorders and major depression, but not that of PTSD. It could be hypothesised that PTSD is more narrowly associated with the subjective frightening experience of the crash – which may be almost independent of the severity of the injuries sustained – while Anxiety disorder and Major depression may be more related with the (severity of) consequences themselves.

3.1.5. Impact on day-to-day, socio-emotional and family life

Table 9 summarizes some key findings in relation to the impact of the crashes on the life of the persons concerned. Please note that no significant differences were observed as a function of transport mode.

Table 9. Impact on day-to-day, socio-emotional and family life as a function of injury severity.

N=545	Grade I severity	Grade II severity	
Ability to fulfil ones' responsibility (mean score)	2.60	3.03	<i>p<.01</i>
Impact on socio-emotional life (mean score)	1.94	2.54	<i>p<.001</i>
Impact on family/household life and functioning (mean score)	2.30	3.13	<i>p<.001</i>
Impact on relatives' personal life (percentage reported impact)	34.3%	53.3%	<i>p<.001</i>
Impact on relatives' professional life (percentage reported impact)	17.9%	44.7%	<i>p<.001</i>
At least one relative had to stop working to take care of you	1.4%	15.7%	<i>P<.001</i>

The dimensions "Ability to fulfil ones' responsibility"¹², "Impact on socio-emotional life"¹¹, and "Impact Family/household life and functioning" (the first three rows in Table 9) were rated on a five point Likert scale ranging from 1 (no impact at all) to 5 (extreme impact). For the total sample, slight (2-rating) to moderate (3-rating) effects were reported by the casualties for these three dimensions. The highest impact was observed for "Taking care of responsibility" (2.87) followed by "Impact on family/household life and functioning" (2.82) and by "Impact on socio-emotional life"(2.31).

As for the impact of the crash on the casualties' relatives (the last three rows in Table 9), 46.1% of the total sample reported an impact on relative's personal life and 34.5% reported an impact on their professional life.

The literature on the impact of a crash on the relatives of the injured victims is very scarce and is therefore difficult to put our results into perspective. In the ESPARR study conducted in the Rhône's administrative department, France (Hours et al., 2013) about 35% of the sample reported that the crash had had an impact on the everyday life of their families while 6.5% reported an impact on the professional life of at least one victim's family member.

In its previous inquiry on the physical, psychological and material damage suffered by traffic casualties and their families, the European Federation of Road Traffic Victims showed that about 80% of the victims' relatives who changed occupation status did so because they were forced by the circumstances (Fédération Européenne des Victimes de la Route, 1997) ; however, unfortunately enough the study didn't report the rates of relatives who changed occupation. In a study conducted in Ghana on how families and communities cope with injured relatives, the most frequently reported coping strategy was reallocation of work within the family (observed for about 82% of the sample), with at least one family member having to take time off from their usual activity to help the injured person or to carry on that person's tasks (Mock, Gloyd, Adjei, Acheampong, & Gish, 2003). While indicative about the impact of crashes on victims' relatives, results from this African study have to be treated with caution in the context of our study given the wide societal difference between Africa and Europe.

As shown in Table 9, higher injury severity is associated with a higher reported impact on all three dimensions covering day-to-day, socio-emotional and family life namely: Ability to fulfil ones' responsibility; Impact on socio-emotional life; an Impact on family/household life and functioning. However, although the effects of severity on these dimensions was statistically significant, the effects themselves were quite modest (an increase of less than one unit on a 5 point Likert scale ranging from no impact at all (1) to extreme impact (5) namely from 1.94-2.60 to 2.54-3.13).

Higher severity is also associated with increased impact of the crash on the casualties' relatives. 53.3% of the seriously injured victims reported an impact on relatives' personal life (against 34.3% for less seriously injured), 44.7% reported an impact on their professional life (against 17.9% for less seriously injured) and 15.7% reported that the relative even had to stop working to take care of the victim (against 1.4% for less seriously injured). Our results are in line with the ESPARR study, (Hours et al., 2013) where more than half of the seriously injured participants (MAIS3≥) reported that the crash had had an impact on the everyday life of their family; this was twice as many as in the mild-to-moderate injury group (MAIS1 or 2) - 55% vs. 22%. The ESPARR study however showed a lower proportion of cases with impact on relatives' professional life (about 6-8%) – as compared to our results – and with no difference between the two severity groups –

¹² Averaged scores for multiple items.

contrary to our results. In line with our study, previous studies (e.g. D. N. Brooks & McKinlay, 1983) also showed that the most noteworthy effect on victims' close family's daily life was on their personal life – in particular the depletion of their leisure time – much more than on professional life.

Altogether, our results show that the effect of severity is clear on day-to-day, socio-emotional and family life. It is noteworthy that even less seriously injured casualties (Grade I severity) also reported non-negligible impact on their day-to-day, socio-emotional and family-life as a consequence of the crash.

Overall, about one third of the sample (33.8%) reported that the crash had had an impact on their living situation either by requiring housing adaptations (13.4%) or moving to a place that was better adapted (20.4%). The impact of the crash on the casualties' living situation appeared to be lower for cyclists as compared to the other road user categories (Table 10). Indeed, while about 85% the cyclists reported no change (no housing adaptation, had not to move to a more adapted place) this was only true for about 60% of the casualties in the other categories.

Table 10. Impact on living situation as a function of road user categories and injury severity.

N=547	Four-wheeler	PTW	Cyclist	Pedestrian		Grade I severity	Grade II severity	
Same as before	62.1%	64.6%	85.7%	62.7%	$p < .01$	90.8%	51.2%	$p < .001$
Housing adaptation	15.3%	14.6%	4.8%	13.7%		4.8%	18.6%	
Had to Move	22.6%	20.8%	9.5%	23.5%		4.3%	30.2%	

Note. PTW: Powered two-wheeler

Injury severity appears to be highly associated with increased changes in living situation: only 50% of seriously injured casualties (Grade II severity) reported *no* change as compared to 90% of the less seriously injured casualties (Grade I severity). Palmera-Suárez et al. (2016) also observed that an increase in the level of severity was significantly associated with increased probability of requiring house adaptation and of moving home due to disability. The authors also reported similar rates as the current study, with the 8.2% of the victims having mild limitation on a Performance severity index¹³ reporting having to move due to disability against 15.5% of those with moderate limitations and 27.6% of those with serious limitations.

3.1.6. Professional and economic consequences

About three quarters of the sample (73.5%) reported having been off work/studies either for a long period (more than three months, 49.2%) or indefinitely (24.3%). The time period off work/studies differs significantly by transport mode (Table 11).

Table 11. Time off work/studies as a function of the road user category and of the injury severity

N=494*	Four-wheeler	PTW	Cyclist	Pedestrian		Grade I severity	Grade II severity	
3 months or less	25.3%	33.7%	27.8%	18.2%	$p < .05$	48.9%	12.2%	$p < .001$
More than 3 months	46.3%	45.3%	60.8%	54.5%		42.6%	53.5%	
Stop working/studies	28.4%	20.9%	11.4%	27.3%		8.4%	34.3%	

* Including only respondents that reported a professional activity or being student at the time of the crash

Note. PTW: Powered two-wheeler

Over half of the cyclists and pedestrians reported a long time period off work/studies, and over a quarter of the car drivers and pedestrians had to stop working or studying (about 30%), when compared to the other road user categories. Overall, the crash impact on professional activity was found to be the highest for the pedestrians with more than 80% of them reporting either long sick leave or definitive leave (81.8%) against 74.7% of the car occupants, 72.2% of the cyclists and 66.2% of the powered two-wheelers. Similarly, Mayou and Bryant (2003) found that pedestrians had on average the longest time off work.

Injury severity is also associated with increased (negative) professional consequences: more than half of the seriously injured casualties had been off work/studies for a long time period (53.5%) and more than a third of

¹³ In this study, performance was conceptualized as the individual's ability to execute tasks in his/her current (i.e., usual) environment.

them had actually stopped working or studying (34.3%). Even for less seriously injured casualties, professional consequences were noticeable: more than half of them declared being off work/studies either for a long period (42.6% for more than 3 months) or definitively (8.4%). Unsurprisingly, previous studies also demonstrated increased professional impact as a function of injury severity. While the Palmera-Suárez and colleagues' study (2016) observed that the moderate-to-serious injured victims had a fourfold higher probability of being retired or unfit for work as compared to the mildly injured, data from the ESPARR study (Hours et al., 2013) showed that 32% of the serious injury group had not returned to work after 1 year, compared to 5% of the mild-to-moderate injury group.

In the MyLAC survey, the respondents that could return to work/studies (or were expecting to be in that situation), were asked additional questions about the adaptation(s) needed for getting back to active life (i.e. job/studies re-orientation, work load adaptation, special accommodations).

Overall, the proportion of the casualties who needed one or another adaptation did not differ between transport modes (about 20-25% did not request any adaptation). Previous studies also showed that the rates of injured traffic crash victims who needed professional adaptations was substantial (Haukeland, 1996) with no difference noticed between transport modes (Tournier et al., 2014). In our sample, some differences were nonetheless observed as to the specific type of adaptation needed (see Table 12).

Table 12. Adaptations needed for getting back to work/studies as a function of the road user category and of the injury severity

N=379*	Four-wheeler	PTW	Cyclist	Pedestrian		Grade I severity	Grade II severity	
Reorientation	45.8%	36.8%	35.7%	36.4%	<i>n.s.</i>	24.5%	53.8%	<i>p < .001</i>
Adapt work load	64.7%	55.0%	60.3%	72.7%	<i>n.s.</i>	54.5%	69.4%	<i>p < .001</i>
Special accommodations	50.0%	56.1%	57.1%	25.9%	<i>p < .05</i>	38.4%	59.0%	<i>p < .001</i>
No adaptation needed	25.4%	25.8%	20.3%	20.0%	<i>n.s.</i>	33.8%	16.9%	<i>p < .001</i>

* Excluding respondents that could not return to work/studies

Note. PTW: Powered two-wheeler

In particular pedestrians had to adapt work load more frequently but fewer of them required special accommodation in comparison to other transport modes. The needs for professional adaptations also increased significantly as a function of the injury severity with less than 20% of the seriously injured not requesting any adaptation against a third of the less seriously injured.

Finally, financial consequences were found to be non-negligible for a substantial part of the sample: 49.5% reporting a decrease in the monthly income of at least 200 €. More than 18.8% suffered a monthly financial income loss of more than 1,000 €. Financial losses were observed for all road user categories (see Table 13) with the highest consequences found for car occupants: more than 55% of them faced a monthly financial loss of at least 200 € and more than 20% even one of more than 1,000 €.

Table 13. Financial income decrease as a function of road user category and injury severity

N=547	Four-wheeler	PTW	Cyclist	Pedestrian		Grade I severity	Grade II severity	
Same as before	44.0%	59.4%	63.1%	52.9%	<i>p < .05</i>	64.7%	41.6%	<i>p < .001</i>
200 – 1000 euros	35.4%	20.8%	22.6%	33.3%		24.2%	34.8%	
More than 1,000 euros	20.6%	19.8%	14.3%	13.7%		11.1%	23.6%	

Note. PTW: Powered two-wheeler

Injury severity was also consistently associated with higher income losses. Previous studies also illustrated economic issues as a consequence of a traffic crash. For example, in Mayou and Bryant's study (2003), over 40% of the sample (N=368) reported financial problems at 3 months and 27% (N=209) at 1 year as a result of the road traffic crash, with no differences according to the transport mode. Similarly, Tournier et al. (2014) found no difference in terms of economic consequences at two years after the crash.

3.2. Results for some specific regions

3.2.1. Introduction

Further analyses were conducted on three subsamples that were considered to be sufficiently homogeneous and representative of their population, although it is recognised that strict representativeness could not be guaranteed:

- Denmark and Belgium, the countries having the largest sample among all participating countries with 91 respondents for Belgium and 208 for Denmark.
- “Western Europe” composed in our study of 5 participating countries (N=274): The Netherlands, Germany, Belgium, Luxembourg and France. With the exception of Luxembourg, the remaining countries reached at least 50 respondents.

In order to provide insight into cross-country/region differences and similarities, descriptive statistics were produced for each of the considered countries/regions as well as comparative analyses between them¹⁴. Country/region descriptives and cross-country/region comparisons were conducted for all variables that have been considered in Section 3.1.; they are discussed and summarized in the same order here.

The full detailed results are only presented in the Appendix, in particular for the variables that showed at least one significant difference between the regions/countries considered.

As a preliminary analysis, the composition of the subsamples were compared. It appeared that subsamples did not differ regarding age and time elapsed since the crash. However, significant differences were noticed when it came to gender composition, age at the time of the crash (in particular for the 25 or less and for the 46-55 age groups), road user categories and prevalence of serious injuries.

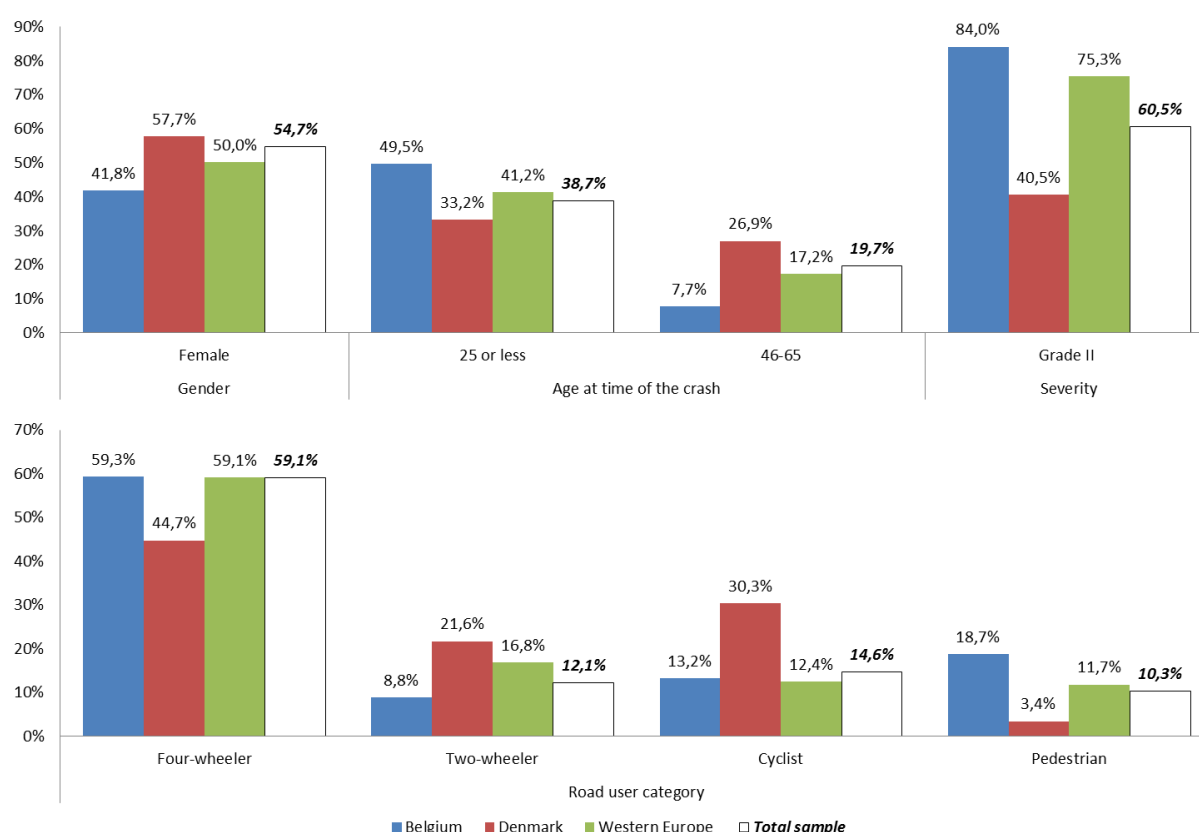


Figure 9. Descriptive statistics of variables that showed significant difference(s) across regions/countries

¹⁴ For prevalence variables (i.e. expressed in percentage of the sample/subsample), chi-square tests were conducted along with post hoc test using the standardized residuals methods and adjusted for the Type I error (Beasley & Schumacker, 1995). For standard numerical variables (e.g. expressed through Likert scales), one way ANOVA test were conducted along with Least Square Difference post hoc test.

As shown in Figure 9, there was a noticeably contrast between Denmark and Belgium, and to lesser extent with Western Europe. In particular, the Danish sample was characterised by higher rates of females (about 60%). This is in contrast with Danish official statistics, which showed that women only made up 36 % of the seriously injured in road traffic in Denmark between 2006-2015 (Vejdirektoratet, 2017), clearly demonstrating a large overrepresentation of women in our sample. The proportion of two-wheelers – powered and non-powered – in the Danish samples constituted about 50% of all road users categories – which represented the highest proportion when compared to the Belgian and Western European samples. However, this figure remains quite consistent with Danish national representative data. Indeed, according to Vejdirektoratet (2017), it appears that seriously injured cyclists and powered two-wheelers represented 22% and 24% respectively, of all road users categories in Denmark for the years 2006 to 2015. This is consistent with broader European datasets, suggesting that, after The Netherlands, Denmark has the highest rates in Europe of citizens aged 15 or more cycling at least once a day (30%, European Commission, 2014). Finally, the Danish sample was characterized by the lowest rates of younger drivers (about a third) and of seriously injured victims (40%) as compared to the two other regions.

In contrast, Belgian victims were predominantly male (about 60%), young – 25 years old or less (about 50%), car occupants (about 60%) and had serious injuries (more than 80% i.e. twice as high as for Denmark). While the figures for gender were consistent with Belgian national representative data (66% male amongst all seriously injured victims, Statistics Belgium, 2017) it showed higher rates of younger drivers and of car occupants as compared to rates observed in Belgium (25% younger than 25 years and 39% of car occupants in 2016, Statistics Belgium, 2017).

The Western Europe subsample showed the same tendency as Belgium with some exceptions as a parity between male and female, higher rates of age group 46-65 at the time of the crash (about 17% as compared to about 8% in Belgium) and higher rates of non-powered two-wheelers (about 17% as compared to about 9% in Belgium).

Given the differing prevalence of seriously (Grade II) and less seriously (Grade I) injured victims across groups, analyses have been conducted separately for the two severity groups, in particular when the variables were thought to be somehow associated with the level of severity. In particular, the following variables were analysed according to their severity groups:

Insurance and justice proceeding

- Did the case go to court?
- No compensation received for neither injuries nor pain and suffering
- Satisfaction with compensation received

Psychological consequences

- PTSD
- Anxiety
- Depression

Impact on day-to-day, socio-emotional and family life

- Ability to fulfil ones' responsibilities
- Impact on socio-emotional life
- Impact on family/household life and functioning
- Impact on relatives' professional life
- At least one relative had to stop working to take care of you
- Impact on living situation

Professional and economic consequences

- Time off work/studies
- Adaptations needed
- Financial income decrease

Only the results for the more seriously injured groups are presented below. The reason for this is twofold. First, some cell-sizes for the less seriously injured group were judged to be insufficient to provide reliable and valid results (e.g. only 13 less seriously injured respondents for Belgium). Second, analyses for more seriously

injured people were judged to be more relevant for our study purpose (e.g. formulating recommendations for decision makers, cross-country comparisons).

Finally, while data for medical consequences were not discussed in this Section¹⁵ (since the same crash/type of crash lead to the same physical consequences whatever the countries or regions) additional variables that taps into victims' own perception of country/region-specific public health quality were considered (see Section 3.2.5.).

Whenever relevant and applicable the results of the specific analyses presented in this Section are compared to the survey conducted by the European Federation of Traffic Victims in 1997 (Fédération Européenne des Victimes de la Route, 1997).

3.2.2. Circumstances of the crash

When compared to the other regions (Figure 10), crashes of the Belgian sample happened more often during the weekend nights (about 25%), on the motorway (about 20%). These figures were notably higher than Belgian national statistics for the year 2016 (11% of crash with seriously injured victims happened during the weekend nights and 11% on the motorway, Statistics Belgium, 2017b).

The crashes of the Belgian sample of this study were reported to a larger extent as having been induced by victim's human factors (more than 40% of the Belgian sample reported own 'errors' such as speeding, inappropriate driving behaviour or alcohol consumption).

Crashes for the Danish sample occurred more frequently on weekdays during the day (for about 70% of the cases) which corresponds to what is seen from the Danish official accident statistics for the years 2006 to 2016 (69% of the people aged 16 or older who were seriously injured in road traffic crashes in Denmark were injured on a weekday between 6 AM and 10 PM, Vejdirektoratet, 2017). Compared to Belgium, crashes from the Danish sample happened less frequently on the motorway (less than 10% of the case) but that also corresponds to national statistics (about 5% of the crashes with seriously injured victims happened on the motorway for the years 2006 to 2015, Vejdirektoratet, 2017). Inappropriate human behaviour was only reported in one out of 5 cases which is half of what was reported for the Belgium sample. This may be explained by the fact that Danish people are much more sensitive and educated to road safety attitudes and behaviour ; which is further reflected by the fact that Denmark has one of the lowest rates in Europe of fatalities per million inhabitants (32 in 2014 as compared to 65 in Belgium and to 57 for the average EU-28 zone, European Road Safety Observatory, 2016).

The Western European sample showed results that were in general intermediate between Denmark and Belgium, except for crash location, where there was a similar high rate of crashes occurring on motorways as in Belgium (about 20%). No differences between the groups were observed regarding the prevalence of the crashes that happened at night during a weekday or in the weekend daytime, in urban/suburban zones or for crashes where the opponent's behaviour could have been considered as causal in the crash.

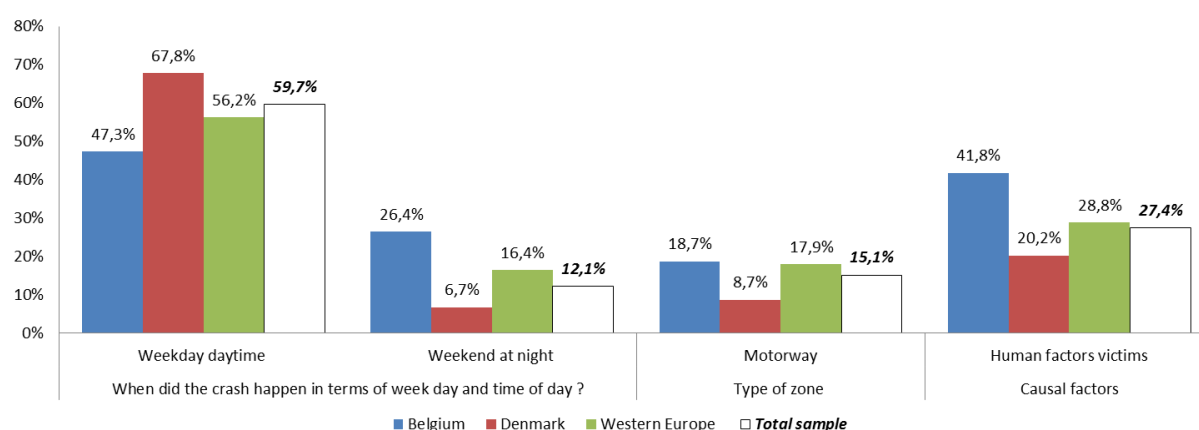


Figure 10. Descriptive statistics of variables related to crash circumstances that showed significant difference(s) across regions/countries

¹⁵ These data are nonetheless presented in the Appendix.

3.2.3. Justice proceedings and insurance claims

No differences were found between the Denmark and Western European subsamples regarding the prevalence of respondents who reported to be – partly or wholly - at fault in the crash (about 20% in both groups) while this figure was significantly higher for the Belgian group (31%). On the other hand, as regards justice proceedings, there were large differences for seriously injured between Belgium and Western Europe on the one hand and Denmark on the other hand (see Figure 11).

About 60% to 70% of the seriously injured victims from Belgium and Western Europe went to court. The length of proceedings lasted more than 3 years for a majority (respectively 59% for Belgium and 54% for Western Europe), hence the very low satisfaction with the length of the proceedings (less than 15% satisfaction for Belgium and less than 30% for Western Europe). With respect to Belgium, excessive delays both in criminal and civil proceedings are not rare and have been frequently noted in the literature (e.g. European Commission for Democracy through Law, 2007). While the criminal proceedings are supposed to take such a long time additional actions in the civil procedures may delay the proceedings to a large extent although they may nonetheless benefit the victims (e.g. request for additional medical exams for the victims).

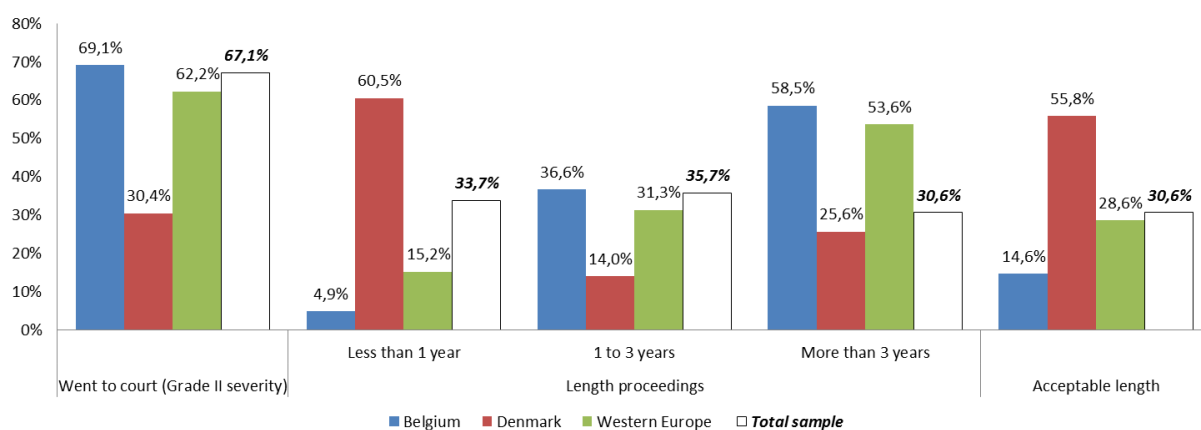


Figure 11. Descriptive statistics of variables in relation to justice proceedings that showed significant difference(s) across regions/countries

The survey conducted by the European Federation of Road Traffic Victims (Fédération Européenne des Victimes de la Route, 1997) also showed that the average duration of proceedings was very long in Belgium (4.5 years) and in other countries from Western Europe (respectively about 4 years in France and in the Netherlands and about 6 years in Germany) – data from other countries of the Western Union or from Denmark were not available.

On average, our study shows that respondents from Belgium and Western Europe have a quite similar pattern of responses, with however a higher proportion of Western Europeans reporting proceedings periods of less than one year (about 15% against less than 5% for Belgians) and higher satisfaction with proceedings length (about 30% against 15% for Belgians).

Responses from Denmark suggest a showed much more efficient justice apparatus which is consistent with existing European cross-country comparisons that suggested that Denmark has one of most efficient judicial systems – based on several indicators, such as length, costs and satisfaction (e.g. ranked first for the time needed to resolve civil, commercial, administrative and other cases, see European Commission. Directorate-General for Justice and Consumers, 2016, for details). Indeed, while less than a third of the cases went to court, more than three out of five respondents report a proceeding lasting less than one year (60.5%) with asimilar amount reporting satisfaction with the proceedings length (about 55.8%).

The picture was also much better in Denmark than in Belgium and Western Europe when it comes to insurance compensation (Figure 12). Less than 15% of the seriously injured Danish victims didn't received compensation for neither injuries nor for pain and suffering and less than a third reported not being satisfied with the compensation. This is probably due to the fact that people in Denmark can get insurance compensation from both their own private insurance - e.g. statutory liability insurance for vehicle - and work insurance - i.e. lost workers' compensation insurance (Danish Business Authority, 2017). On the contrary, in Belgium and Western Europe, the proportions of the seriously injured victims that did not receive any compensation and that were not satisfied with compensation were much higher than in Denmark – respectively 46.6% of the Belgians and 37.8% of the Western European did not receive any compensation and about half of the Belgians and the Western Europeans were not satisfied with the compensation. These

relatively high figures need to be treated with caution and may be partially explained by the fact that length of proceeding is particularly long in those regions (insurance may wait for a judicial decision before paying compensation) and that victims may not have been compensated yet (while the Danish justice apparatus was shown to be much more efficient and rapid).

Another factor that may have contributed to this high rate for the Belgian subsample is the fact that a larger proportion of them – as compared to the two other subsamples – reported having been considered at fault (partly or wholly) and therefore they could not claim compensation for the crash.

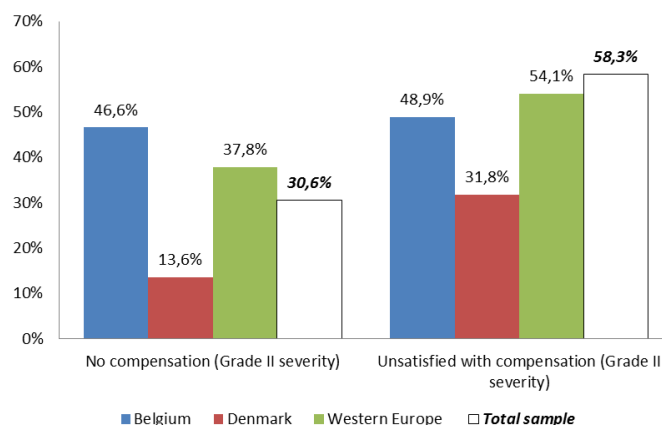


Figure 12. Descriptive statistics of insurance compensation variables that showed significant difference(s) across regions/countries

The survey conducted by the European Federation of Road Traffic Victims (Fédération Européenne des Victimes de la Route, 1997) also showed that a large proportion of the victims (or their relatives) from Belgium and from other countries of Western Europe (including France, Germany and the Netherlands) were not satisfied with the compensation received (about 75% for Belgium and between 70 and 90% for the other Western European countries) – data from Denmark were not available.

3.2.4. Psychological consequences

As mentioned above, analyses regarding psychological consequences were only presented for the more seriously injured groups (Grade II severity). No difference between countries/regions were found regarding the prevalence of Depression. For the two other diagnostics (Figure 13), PTSD and Anxiety, Belgium showed the lowest prevalence (about 50% for PTSD and 35% for anxiety) while Denmark showed the highest prevalence (about 65% for PTSD and 50% for anxiety). Western Europe remains in-between but is closer to the Danish situation.

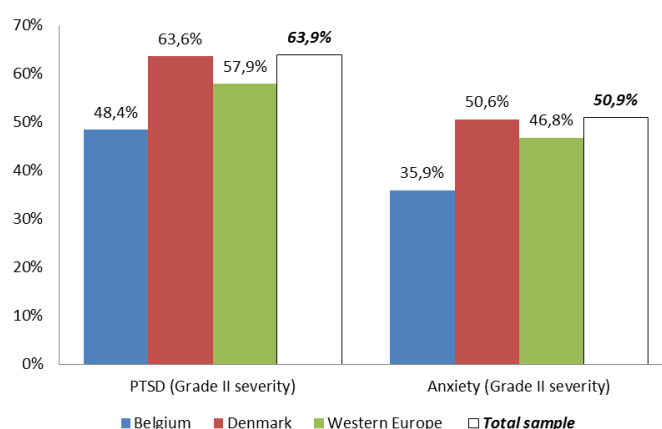


Figure 13. Descriptive statistics of psychological variables that showed significant difference(s) across regions/countries

Contrary to our results, the survey conducted by the European Federation of Road Traffic Victims (Fédération Européenne des Victimes de la Route, 1997) did not show a statistically significant difference across countries regarding psychological outcomes.

3.2.5. Public health

While no differences in quality were observed for medical treatment and social services between the three subsamples, the Danish gave the highest ratings for the quality of the mental health, and for the technical/logistic support offered in their country (Figure 14, upper part).

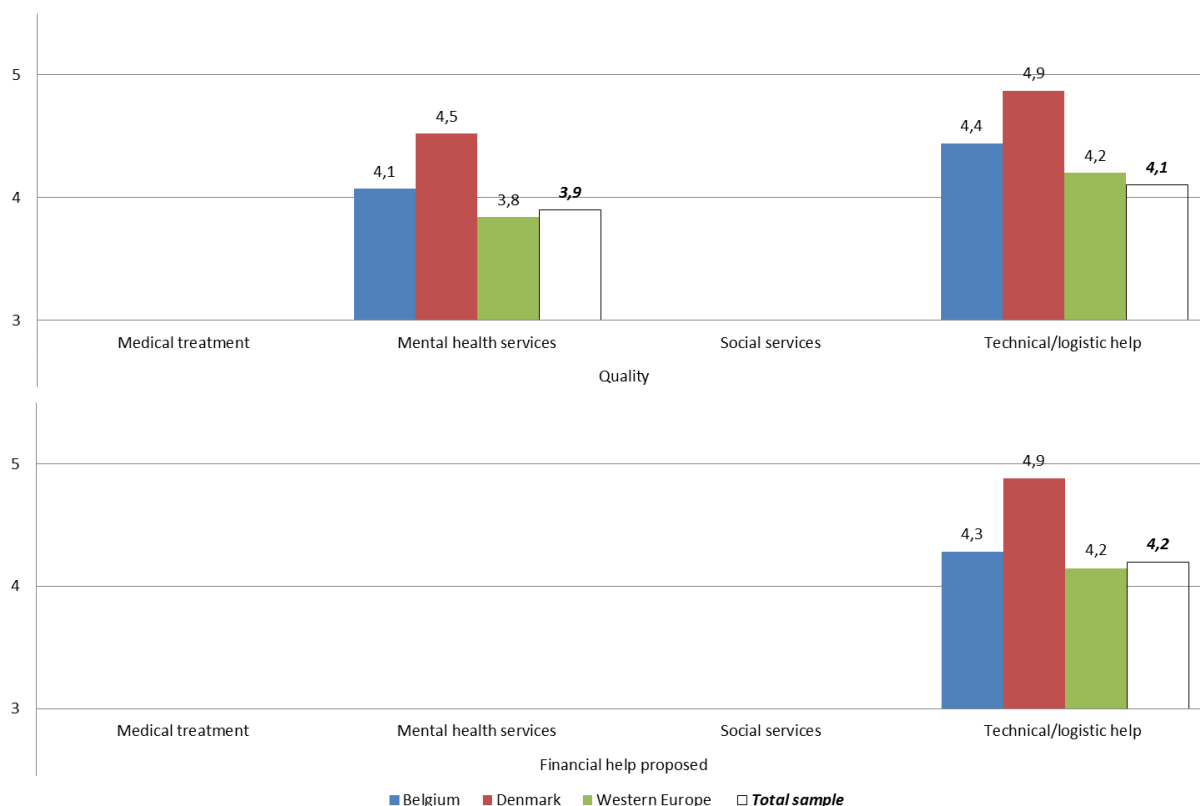


Figure 14. Descriptive statistics of public health variables that showed significant difference(s) across regions/countries

Regarding the financial assistance received in the context of these medico-social services, the only difference was noticed for technical/logistic support with the highest rating in Denmark (Figure 14, lower part). The relatively better scores for Denmark may be due to the fact that the social welfare system is better funded in Denmark as compared to the two other regions. Indeed, while the government expenditure for sickness and disability represented 4.8% of the gross domestic product (GDP) in Denmark it represents 3.5% of the GDP in Belgium and 3.1% for the Western European countries considered in the last subsample - averaged figure (Eurostat, 2017).

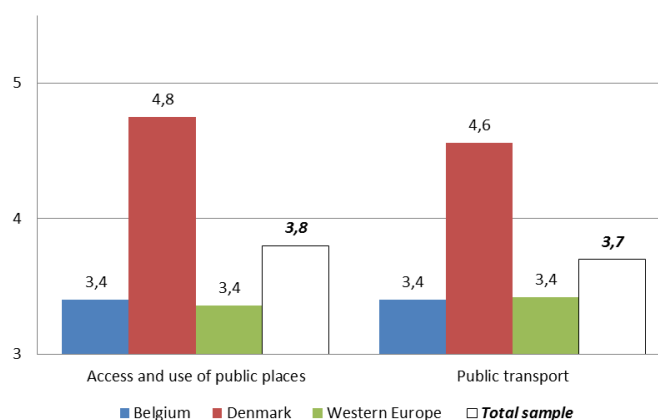


Figure 15. Descriptive statistics of public health variables (access and use of public places and public transport) that showed significant difference(s) across regions/countries

As shown in Figure 15, Danish people gave the best ratings for both access to public places and public transport for people with reduced mobility, (rating of more than 4.5 with 5 being the best rating possible

(extremely satisfied)). This most probably reflects the Disability policy measures and regulations that are particularly stringent in Denmark (Det Centrale Handicapråd, 2017).

Both Belgium and Western Union respondents gave a moderate to good rating (around 3.5) for both access to public places and public transport. Disability policy measures and regulations obviously also exist in these countries but seems to be less well provided than in Denmark (at least from the victims' point of view).

3.2.6. Impact on day-to-day, socio-emotional and family life

No differences were observed between regions/countries regarding the potential impact of the crash for the seriously injured victims (Grade II) on their relatives' personal life. But noticeable differences were observed concerning the impact on the professional life of the relatives (Figure 16), in particular, concerning the proportion of relatives that had to stop their professional activity to take care of the road victim.

Danish respondents (about 6%) were twice as low as Belgian (about 12%) and three times as lower than the Western European (about 17%) to report a cessation of professional activity in the part of their relatives. This is probably due to the strong insurance structure and the flexible work environment provided in Denmark (Work in Denmark, 2017).

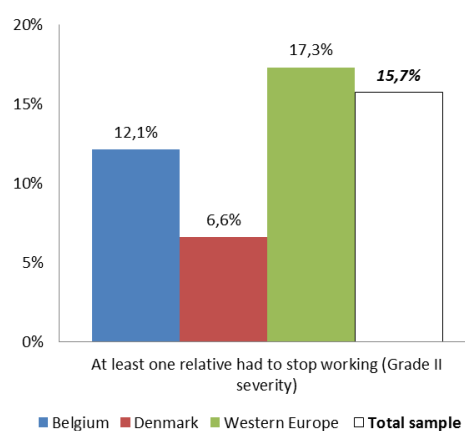


Figure 16. Descriptive statistics for relatives professional leave across regions/countries

Regarding the impact on day-to-day life for the seriously injured victims (Grade II severity), the Danish respondents consistently reported a lower impact than Belgians and Western Europeans on (1) the ability to fulfil one's responsibility, on (2) socio-emotional life and on (3) family/household life and functioning (Figure 17).

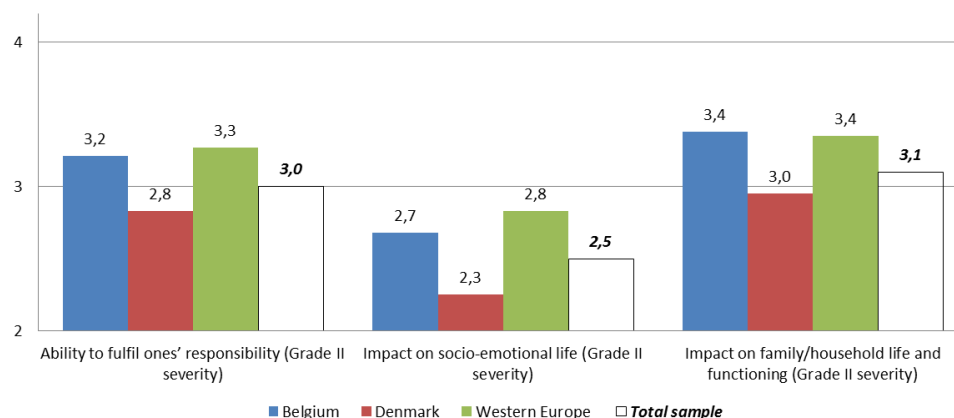


Figure 17. Descriptive statistics of day-to-day life variables that showed significant difference(s) across regions/countries

The impact on the living situation also differs as a function of the region/country (Figure 18), in particular for the Danish, with a higher percentage of them reporting no change in the living situation and a lower percentage that reported having to move as a consequences of the crash. On the other hand, no difference was noticed regarding the necessity of requiring housing adaptation for the victims.

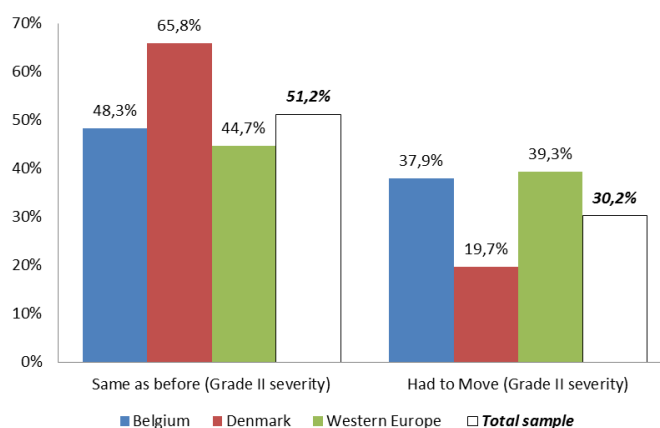


Figure 18. Descriptive statistics of living situation variables that showed significant difference(s) across regions/countries

In contrast with our results, the survey conducted by the European Federation of Road Traffic Victims (Fédération Européenne des Victimes de la Route, 1997) did not show a statistically significant difference across countries regarding social outcomes.

3.2.7. Professional and economic consequences

No differences in the proportions of long sick leaves (more than 3 months) were observed between the three subsamples. As shown in Figure 19 (left part), the proportion of Danish that had to cease their professional activity for a shorter period (3 months or less) was much higher than in the other subsamples (about 25% against 5% for Belgians and Western Europeans).

The Danish were also much less likely to face a permanent cessation of professional activity (less than 20% against about 45% for Belgians and Western Europeans).

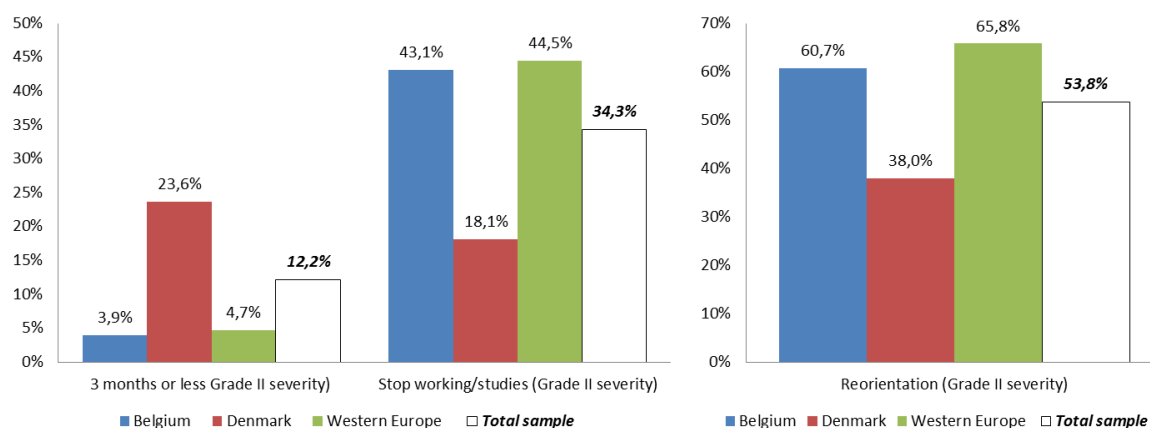


Figure 19. Descriptive statistics of professional leave variables and needs of professional reorientation across regions/countries

Among the seriously injured victims (Grade II severity) that could get back to work, a lower proportion of the Danish sample considered professional reorientation (less than 40% against more than 60% for Belgians and Western Europeans, Figure 19, right part) while no differences were observed regarding the need to adapt workload or to require special accommodation of the workplace.

When it comes to the financial impact on monthly revenues, only 3 out of 10 Belgians reported that their financial situation remained the same as before (as compared to 50% of the Danish and about 40% of the Western Europeans, see Figure 20).

However, among the Belgians that reported financial impacts, most of them reported a moderate impact (between 200 and 1000 euros per month). The proportion of victims that reported a financial impact of more than 1000 euros did not differ across regions/countries.

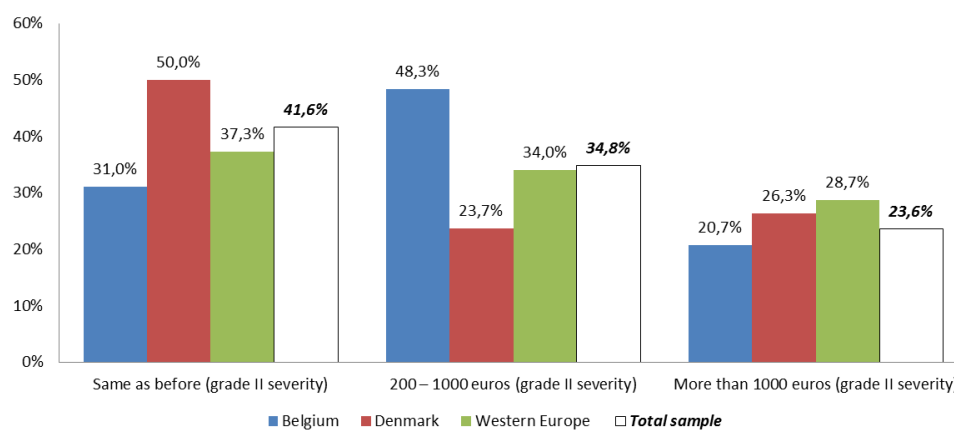


Figure 20. Descriptive statistics of financial impact variables that showed significant difference(s) across regions/countries

4. Conclusion

4.1. Overall findings

Our preliminary analyses showed that the distribution of traffic victims was quite similar across the four European regions considered (East, West, North and South), the main exception being that females were more represented in Northern and Eastern Europe than in the South and the West.

However, it is recognised that our sample is, overall, not representative of the European people injured in traffic, since, amongst other things, over 60% of the respondents were seriously injured, which is much higher than in official crash statistics. Also, females and car occupants were overrepresented when compared to official data, whilst cyclists were underrepresented. As for the age at the time of the crash, the data showed that a vast majority of the sample (about 80%) was quite young when the crash occurred (45 or less) which is quite consistent with existing studies (see for example Dupont & Meunier, 2017, for a Belgian National representative study). The majority of the crashes of the respondents occurred in urban and suburban zones (about 60%).

Keeping those elements in mind, our study nonetheless provided relevant and exploitable data, because, amongst other factors, of the size of the sample and its relative homogeneity across regions within Europe. Moreover, most analyses were conducted separately for each transport mode and for the two defined severity levels. This approach avoided the risk of a category being over- or underweighted as compared to the other.

Over 70% of the respondents declared that no human action from their side caused the crash and almost 80% declared not to be at fault. In over 80% of the cases, the human behaviour or other human factors of the opponent was seen to be the (main) cause of the crash (with inappropriate driving behaviour and inattention/distraction being the most frequently reported in respectively 49% and 43% of the cases). Non-human causal factors (e.g. atmospheric conditions, car failure and road conditions/infrastructure) were mentioned in 4 out of 10 cases.

About one half of the not-at-fault victims went to court. Over 50% of them were not satisfied with the outcome of the proceedings, and 66% were not satisfied with its length – 40% reported that the proceedings had lasted more than 3 years. Not surprisingly, satisfaction with the insurance compensation was also quite low. One third of the respondents reported that they had received no compensation for neither injuries nor for pain or suffering.

Head injury was the most frequently sustained injury for car occupants (about 80%) and for pedestrians (about 60%) followed by other/unspecified injuries and vertebral and spinal injuries for car occupants (respectively about 55% and 50%) and by other/unspecified injuries and by lower extremities injuries for pedestrians (respectively about 60% and 55%). Other/unspecified injuries were the most frequently reported by cyclists (about 75%) and by powered two-wheelers (about 55%) followed by head and upper extremities injuries for cyclists (respectively about 60% and 45%) and by lower and upper extremities injuries (about 50% for the two types). With the exception of vertebral and spinal injuries, increased severity (Grade II vs. Grade I) was associated with higher occurrence of each type of injury. Overall the average number of body regions impacted during the crash was 2.26 and this figure did not differ significantly as a function of the transport mode. Higher severity was associated with a higher number of impacted body regions (3.03 vs. 1.84) and a higher number of injury types (6.5 vs. 3.5) and with a much lower rate of full recovery (about 20% vs. 50%).

The injury sustained – and in particular its severity – was also found to be associated with substantial functional loss in daily life. Functional loss in each of the investigated dimensions was found as well for less serious and for more serious injuries and this loss increased significantly – in all dimensions – for more serious injuries. Limitation in daily life activities and increased pain were the most evident loss (about 50% loss) for less serious injuries while limitations in mobility, daily life activities, self-care and increased pain were the most evident for more serious injuries (about 75% of functional loss). As opposed, no transport mode-related differences were found for functional health.

A large part of the respondents suffered from psychological disorders one month after the crash with the most frequently reported being related to PTSD (about 60% of the sample) followed by major depression (about 55%) and anxiety disorder (about 45%). While psychological consequences didn't differ as a function of the transport mode, increased severity was associated with increased rates of anxiety and depression (but

not PTSD). However, it was hypothesised that PTSD may be more narrowly associated with the subjective frightening experience of the crash while Anxiety disorder and Major depression may be more related with the (severity of) consequences themselves.

Overall, the impact of the crash on day-to-day, socio-emotional and family life was evaluated to be slight or moderate. But more than one third of the sample reported that the crash had had an impact on the personal or professional life of at least one of their relatives. An impact on living situation (housing adaptations or necessity to move) was also reported by a third of the sample. The influence of the transport mode at the time of the crash was only evident for the living situation, with cyclists reporting lower impact as compared to the other road user categories. But the severity of the injury was associated with all aspects: increased impact on day-to-day and socio-emotional life, increased impact on relatives' personal and professional lives and increased impact on living situation.

About three quarters of the sample reported having been off work/studies either for a long period or indefinitely. Overall, the crash impact on professional activity was found to be the highest for the pedestrians with more than 80% of them reporting either long sick leave or indefinite leave (81.8%) against about 65% to 75% for the other road user categories - which is also a very high figure. More than 85% of the seriously injured reported having been off work/studies either for a long period or indefinitely. Even for the less seriously injured respondents the professional consequences were quite considerable: over 50% were off work/studies either for a long period or definitively. Overall, half of the victims reported a monthly financial income decrease of at least 200€ and about 20% a decrease of at least 1.000€.

4.2. Cross-region comparisons

Along with the main analyses conducted on the whole sample, further analyses were conducted on three subsamples - considered to be sufficiently large, homogeneous and representative of their population - for comparative purposes between EU sub-regions. The three subsamples considered were Belgium (N=91), Denmark (N=208) and Western Europe (N=274, including The Netherlands, Germany, Belgium, Luxembourg and France). These cross-region/country comparisons analyses were conducted on dimensions thought to be region-dependent including insurance and justice proceedings, psychological consequences, impact on day-to-day, socio-emotional and family life, professional and economic consequences and perception of country/region-specific public health quality. In order to offer sufficiently large and homogeneous cells for comparison, less serious injured victims were excluded from these complementary analyses as this subgroup represents only a very limited number of respondents in certain countries/regions.

As for the crash circumstance, Danish respondents reported more frequently than the other regions that the crash had happened during a weekday in daytime while the reverse was observed for crashes occurring on a weekend at night. For the Danish sample, crashes also occurred less frequently on the motorway (about 8%) than was the case for the two other regions (about 20% for Belgium and for Western Europe). Human causal factors on the side of the victims were only reported by 20% of the Danish respondents while this figure yielded about 30% and 40% for the Western European and the Belgian subsamples respectively.

While about 30% of the Belgian respondents were considered to be at fault in the crash, the figure only reached 20% for the two other regions.

As for the justice and insurance appraisals, our results showed a much better efficiency in Denmark than in the two other regions with the worst indicators being for Belgium. About 60% to 70% of the seriously injured victims from Belgium and Western Europe went to court while this was only the case for about 30% of the Danish respondents. For a majority of Belgians and Western Europeans (about 55%), the proceedings lasted for more than three years. Conversely, the proceedings lasted less than one year for about 60% in the Danish sample and for only 25% it lasted more than three years. Similarly, while a substantial part of the Western European and Belgian samples (respectively about 35 and 45%) did not receive any compensation at all from the insurance, this was only the case for 13% of the Danish respondents. Consequently and logically, satisfaction about justice proceedings and insurance compensation was much higher for Denmark than for the two other regions.

No differences between countries/regions were found regarding the prevalence of Depression. Belgium showed the lowest prevalence for the two other diagnostics, PTSD and Anxiety (about 50% for PTSD and 35% for anxiety) while Denmark showed the highest prevalence (about 65% for PTSD and 50% for anxiety); Western Europe remains in-between. These poor results for the Danish sample are surprising – as service and

resources for supporting victims are on average better in Denmark, especially as Danish respondents rate their public health system more highly, than the two other regions (in particular for mental health service quality and for technical/logistic help).

Access to public places and to public transport for people with reduced mobility were rated as extremely satisfying in Denmark while Belgian and Western European respondents gave a moderate to good rating.

As for the impact on day-to-day, socio-emotional and family life, Danish respondents reported on average fewer major consequences than the two other regions, in particular for the impact on the victims' relatives' professional life (lower rates of career interruption) and on the victims personal and family/household life and functioning and for the living situation (i.e. more Danish respondents reported having the same living situation as before and fewer of them reported having had to move for a more adapted place).

Finally, Danish respondent reported fewer negative outcomes both for their professional and financial situation and this was observed for almost all indicators considered in the current study (e.g. length of sick leave, rate of permanent professional leave, financial impact on monthly revenues).

4.3. Limitations of the study

It is recognized that the MyLAC study has a number of limitations. The heterogeneity of the sample size and composition across countries has already been mentioned. To some extent, this may have been due to the considerable differences noticed across countries/organizations regarding the resources and efforts dedicated to the survey dissemination (as they were free to organize the dissemination activities in the way they wanted). However, as analyses were conducted either on the whole sample or on reasonably large samples and separately for each transport mode and for the two defined severity levels, these approaches avoided the risk of a category being over- or underweighted as compared to the other and limited the potential impact of biases related to country sample size and composition heterogeneity.

Another limitation is that the respondents predominantly consist of people who are somehow related to the nature of the associations that took part to the dissemination of the survey (e.g. road casualties associations, trauma patient association, etc.). It is unclear what type of bias this might have introduced, although it can explain why we have a relatively high proportion of seriously injured casualties in the sample. In that respect, it can be hypothesized that casualties who have experienced more serious consequences of a crash or still have persistent memories of it – despite the time elapsed since it occurred – may be more likely to respond to the questionnaire than people who experienced fewer problems. This further seems to be confirmed by the fact that a vast majority of the victims who took part in the study (more than 85%) experienced a crash that happened more than one year before the time they completed the survey.

Due to the retrospective nature of the survey, the time elapsed after the crash – which differs widely between respondents, may also have led to biased results. While this makes comparisons of consequences between respondents more difficult and in any case less accurate, the potential impact on our analyses – in particular cross-country/region comparisons – was seemingly limited as no differences were found between subsamples (i.e. Belgium, Denmark and Western Europe) nor between road user types regarding the proportion of recent and less recent crashes.

Another issue is that the reported consequences are based on self-declaration. The assessment of such consequences is subjective and differs between persons based on their personal situation, characteristics and perception. The advantage of using self-response is precisely that it measures actual perceived consequences, and hence the subjective aftermath of the crash. The disadvantage is that it is not objective and therefore, differs from respondent to respondent (as a function of their own characteristics) and also changes over time. Thus, differences between victims may not always be due to differences in objective crash outcomes but also due to differences in the subjective perception of it. Finally, the self-reporting nature of the data collection also excluded at the outset certain subgroups of injured victims. Indeed, although potential respondents were told that they could ask a relative to help them and fill it out in their name, it is not likely that certain categories of seriously injured victims – in particular, seriously cognitive impairment such as aphasia – could have access the survey.

Because of these limitations, conclusions have to be drawn with caution. They remain nonetheless informative about how consequences of road traffic crashes may vary as a function of the transport mode and of injury severity.

4.4. General discussion

The MyLAC study provides an insight into the magnitude of the consequences of a road traffic crash within various aspects of a casualty's life. Despite the above mentioned limitations, our study nonetheless provided relevant and exploitable data, amongst others because of the size of the sample and its relative homogeneity across regions within Europe.

Overall, our study showed the considerable effects of the road traffic crash on all aspects and spheres of the victim's life – and also on those of their relatives. Consequences were found to be substantial for all categories no matter the transport modes, and for serious but also for less serious injuries (although more seriously injured victims logically faced more drastic consequences).

From the point of view of the victims, the main factors involved in the crash causation were mainly attributed to human misbehaviour in the opponent side (in about 80% of the cases) followed by non-human factors (40%) and by human misbehaviour in their own side (30%). Causal factors involved in the crash however differed widely between regions, with human factors on the victim's own side being, for example, much more frequently acknowledged in the Belgian sample (40%) than for the Danish sample (20%). Similarly and logically, Belgian victims were more frequently considered to be at fault than the other groups. Altogether, the much higher proportion of non-at-fault victims found in our sample suggests that these respondents may be more keen to disclose and to bear witness to their experiences and their conditions while the guilt associated with the fact of having caused a crash – potentially involving injuries or property damage – may induce a certain reluctance to disclose and to recall bad memories and shame.

As a corollary, the small proportion of at-fault victims may have prevented current study results from fully covering the whole range of human consequences and damages potentially associated with a road traffic crash. In that respect, further research should usefully investigate differential impacts of road traffic crashes for at-fault and non-at-fault victims. It might be hypothesised that bad feelings and self-image as well as judgement from others for the person who bears the responsibility of other persons' injuries – or even death – may have induced a totally different picture of human consequences, in particular for psycho-social aspects.

As for the justice proceedings and insurance compensation, our results showed that a large proportion of the victims were not satisfied about the outcomes and this was the case for the charges/sentences pronounced, for the length of the proceeding and also for the insurance compensation. Despite these poor results for the total sample as a whole, Denmark was shown to perform much better than the total sample and the two other regions (Belgium and Western Europe) on all these dimensions; results that are consistent with other existing European cross-country comparisons that suggest that Denmark has one of most efficient judicial system (European Commission. Directorate-General for Justice and Consumers, 2016).

As for medical, functional and psychological consequences, our results showed that the crash has major consequences for all victims. While results differs in terms of injuries type and location as a function of the type of road users, no road user specific differences were shown, neither for the injury severity, its functional implication (functional loss), nor for psychological consequences. Conversely, injury severity was associated - with some exceptions (e.g. PTSD) - with much more deleterious consequences and this was observed for medical, functional and psychological consequences. Altogether, the medical and psychological consequences were found to be major and not only for the seriously injured victims but also for the less seriously injured ones. With that respect, one should bear in mind that while our study was composed of a minority of less serious injured victims, official statistics and representative studies showed exactly the opposite picture with a vast majority of victims being lightly or moderately injured (e.g. Bohman, Stigson, & Krafft, 2014; Gustafsson, Stigson, Krafft, & Kullgren, 2015). The societal impact of the less seriously injured victims should therefore not be neglected further as they may face major consequences and as their much larger participation as compared to serious injuries confers them the largest share of the global burden of traffic injuries in society (see for example, Malm et al., 2008; Weijermars et al., 2017).

It is noteworthy that the prevalence of psychological symptomatology was quite high when compared to other studies (e.g. Mayou et al., 2001). While this may be due to the relative high prevalence of seriously injured victims in our sample or to the fact that we could not control durations since crash – respondents that experienced the crash in a distant past may have blurry and exaggerated memories about how they felt in the past, – psychological morbidity may also have been overestimated as the respondents had to rate their mental state at one point in time while most psychological disorders need to meet some duration criteria to reach a diagnostic threshold (e.g. PTSD symptoms have to last for more than 1 month ; American Psychiatric Association, 2000).

Surprisingly, psychological consequences – in particular for PTSD and for anxiety - were found to be less serious for the Belgian samples as compared to the two other subsamples. Further study should usefully investigate this aspect as no plausible explanation was found for this effect.

While impact on day-to-day, socio-emotional and family life was on average evaluated as slight or moderate, a substantial part of the sample (more than one third) reported that the crash had had consequences on at least one of their relatives' personal or professional life. Impact on living situation (housing adaptations or necessity to move) was also reported by a third of the sample. Regarding professional and financial consequences, about three quarters of the sample reported having been off work/studies either for a long period or definitely, and half of them reported a financial income decrease (monthly) of at least 200€. While injury severity has a consistent negative impact on all these dimensions, comparisons between road users provided more mixed results. The results however tend to suggest that cyclists suffer the less serious consequences – in particular having to change their living situation as a result of the crash less frequently than the other categories – and that the pedestrians suffered from the most serious consequences – reporting longer sick leave and more frequent definitive leave. Cross-region/country comparisons, suggested that Danish respondents consistently reported less serious consequences on all these dimensions than the two other regions (Belgium and Western Europe). Our results here are consistent with the previous inquiry conducted by the Fédération Européenne des Victimes de la Route in 1997 which showed that a vast majority of the injured victims and their families reported a significant permanent decline in their quality of life, and in half of the cases the consequences were especially serious (Fédération Européenne des Victimes de la Route, 1997).

Finally, the cross-region/country comparisons also allowed us to tap into aspects related to public health issues. Respondents were asked to report about the quality – their satisfaction with – of the public health resources and facilities as provided in their own country. The results showed that Danish respondents rate their public health system better than the two other regions (in particular for mental health service quality and for technical/logistic help) and that they were extremely satisfied with the quality of access to public places and to public transport for people with reduced mobility (while Belgian and Western European respondents gave a moderate to good rating).

4.5. Recommendations

Our results showed that about half of the victims that were not considered at fault did not go to court and that a similar proportion of them did not receive any compensation for neither injuries nor for pain and suffering. One possible explanation for that - which was already noted in the previous FEVR inquiry (Fédération Européenne des Victimes de la Route, 1997) - is that the victims lack of information about their rights or about potential resources offered to them and that they are not sufficiently assisted in this process. While in most of the countries public centres or private initiatives do exist for providing victims with free help, advice and/or resources in various areas such as legal and insurance aspects, medicine, psychology or even social, administrative and logistic help and support (e.g. 'services d'aide aux victimes' in Belgium), it seems that victims do not sufficiently benefit from these initiatives, presumably for various reasons (e.g. lack of visibility/accessibility, type and quality of advices and/or resources provided, etc.). We recommend, therefore, dedicating more effort to increasing the efficiency of these centres in terms of accessibility – systematic contact between these centres and the victims should be ensured – and of the quality and the personalisation of the services provided. Moreover, while in certain countries different types of associations offer different type of services, additional efforts should be made to increase connections and collaborations between them in order to offer integrated and transdisciplinary services. Finally, the role of these centres could be extended in the long term, making provisions for the victims – and potentially, their relatives – to be represented and accompanied through every procedure following the crash by a person they trust, in order to feel supported and to be aware and assured of their rights.

The current study also showed that even if the victims have access to the judicial system or are eligible for insurance compensation, they are for a large proportion not satisfied with the outcomes either in terms of compensations/judicial decisions or in terms of lengths of proceeding. This is even more detrimental as studies have shown that victims and even victims' families are adversely affected by complicated and lengthy procedures, especially regarding psychological complaints and symptoms (Elbers, Hulst, Cuijpers, Akkermans, & Bruinvels, 2013; O'Donnell, Creamer, McFarlane, Silove, & Bryant, 2010). In that respect, examples of best practices could be taken from countries that perform better on these topics and our results suggest that Denmark could be an eligible candidate for that. As an example, efforts could be made to improve and

regularly review the level of compensation to correspond to actual damages and to require insurance companies to provide immediate advance payments (interim) to victims to cover at the onset loss of earnings, medical treatment and other indirect costs. Legal procedures should also be simplified and sped up to better fit to the victim's circumstances. As for the offenders, sentences should also be sufficiently serious to provide a deterrent. As a corollary, alternative punishments should also be considered for the education of offenders.

It is noteworthy that right after the crash, the injured victims face numerous cumbersome administrative procedures, right at the moment where they are most vulnerable and potentially lacking in their own resources. In that respect, attempts should be made to streamline this process, for example, in proposing simplified and integrated/centralised procedures. Connections and collaboration between services – e.g. information/support, justice, insurances, health/mental health – could be further optimised by capitalizing, for example, on new technologies (e.g. integrated and transdisciplinary electronic records system and/or platform). Finally, the above mentioned centres – as a front-line players – could also take a role in bridging links between all type of services and resources.

Considerations about the quality of the medical and psychological care and services is beyond the framework of this study. However while the speed and the efficiency of post-crash responses and of medical intervention have been found to be a crucial factor in subsequent medical and even psychological consequences (World Health Organization, 2016), further efforts should be to take advantage of the possibilities permitted by new technologies : e.g. generalisation of eCall services to all cars and vehicles ; linking police first observation at scene with the hospital records through an integrated electronic record systems and/or databases. Similarly, a better concordance between police and hospital data bases and/or record systems could – prospectively – help to better relate the type of crash and its circumstances with the human consequences for the victims and, therefore, to better inform intervention policies in the future.

Currently, the lack of concordance/linkage between police and hospital data is recognised as having an effect on the quality of data registration (see for an in-depth discussion, Pérez et al., 2016). Consequently, most countries still rely on separated data record systems for the police and for the hospital registration systems. Moreover, increasing the quality of data recording systems is important to better understand the ways in which road safety interventions can be effective (Khan, Ahmed, Zia, Babar, & Babar, 2007). Finally, early – and obviously appropriate – mental health interventions have also been found to be linked to subsequent psychological complications (Harrison, 1999). To that extent, early psychological screening after the crash could be generalised in order to assess the risk of subsequent psychological complications and to ensure appropriate and early intervention.

Our results show that on average the impact of the road traffic crash on the victims was non-negligible on day-to-day, socio-emotional and family life, on relatives' personal and professional lives, as well as on the victims living situation and this was also observed – although to a lesser extent – for the less seriously injured victims. In this respect, Denmark quite consistently showed better outcomes on all these dimensions compared to the whole sample and to the two other subsamples. It has been hypothesised that these better scores on these dimensions were at least partly attributable to the strong insurance structure and public health systems and the flexible work environment provided in Denmark (Work in Denmark, 2017). From a broader point of view, it is here referred to the quality of life in a more general sense and it is recognised that it is dependent on a wide variety of factors and on many different actors (insurance compensation, judgement outcomes, health/mental health services, social and logistics support, community-based initiatives, etc.). With this respect, it is important that all stakeholders cooperate in developing and implementing adequate and personalised interventions and actions. These should be developed, promoted and monitored by public authorities through integrative and transdisciplinary social policies aimed at developing the livelihoods and wellbeing of road traffic crashes victims and families. It is also of extreme importance that this cooperation operates in the long term in guiding and accompanying victims and their family from the acute medical intervention to rehabilitation and to their progressive reintegration in the society. In this respect, it should be noted that not only serious injuries but also less serious injuries may have substantial consequences on all aspects of victim's life.

While the current report focused on the human consequences of road traffic crashes, consideration about road safety measures and policies fell outside its scope. However, one should not ignore the fact that road safety is the main preventative means for reducing the global burden of road traffic injuries for societies. In that respect, the health impacts and burden of road traffic injuries from a road safety point of view are relatively new research fields. Road traffic mortality was until recently the sole preoccupation of decision makers but nowadays road traffic injuries are increasingly considered as an additional indicator for road safety policy making. In line with the results presented in this report, road safety campaigns could raise

peoples' awareness to a broader extent on long term sufferings as a result of road traffic crashes. Moreover, these initiatives to raise awareness about the consequences of road crashes could be further extended – not only through public campaigns – and percolate through the world of education – e.g. as integrated in basic school citizenship education or even in the driving education systems.

List of tables and figures

Tables

Table 1. Survey translators	20
Table 2. Lists of the organisations that participated in the dissemination	20
Table 3. Composition of the MyLAC sample.....	26
Table 4. Prevalence of human and non-human factors evoked in crash causation.....	30
Table 5. Average number of body regions impacted and proportion of injuries reported – by location – for each road user category and as a function of injury severity	31
Table 6. Number of injuries sustained and prevalence of full recovery as a function of injury severity.....	32
Table 7. Functional loss one month after the crash – as compared to the pre-crash situation – based on EQ-6D scores and as a function of injury severity.....	32
Table 8. Proportion of respondents reaching the diagnostic threshold for Post-Traumatic Stress Disorder (PTSD), Anxiety disorder and Major depression one month after the crash.	33
Table 9. Impact on day-to-day, socio-emotional and family life as a function of injury severity.	34
Table 10. Impact on living situation as a function of road user categories and injury severity.	35
Table 11. Time off work/studies as a function of the road user category and of the injury severity.....	35
Table 12. Adaptations needed for getting back to work/studies as a function of the road user category and of the injury severity.....	36
Table 13. Financial income decrease as a function of road user category and injury severity.....	36
Table 14. Comparisons between specific countries/regions for sample composition, crash circumstances and justice and insurance variables	59
Table 15. Comparisons between specific countries/regions for medical, psychological and public health variables.....	60
Table 16. Comparisons between specific countries/regions for personal life and for professional and economic situation variables.....	61

Figures

Figure 1. ICF model: interaction between ICF components	18
Figure 2. Adapted ICF model with the MyLAC study variables/dimensions	19
Figure 3. Sample sizes by countries and regions	24
Figure 4. Map illustrating sample sizes by countries.....	25
Figure 5. Map illustrating relative sample sizes by countries (per million inhabitants).....	25
Figure 6. Proportion of Grade I vs. Grade II severity injuries as a function of the road user categories	27
Figure 7. Distribution of the sample as a function of the time of the crash and its location.....	29
Figure 8. Prevalence of human and non-human factors evoked in crash causation	30
Figure 9. Descriptive statistics of variables that showed significant difference(s) across regions/countries...	37
Figure 10. Descriptive statistics of variables related to crash circumstances that showed significant difference(s) across regions/countries.....	39

Figure 11. Descriptive statistics of variables in relation to justice proceedings that showed significant difference(s) across regions/countries.....	40
Figure 12. Descriptive statistics of insurance compensation variables that showed significant difference(s) across regions/countries	41
Figure 13. Descriptive statistics of psychological variables that showed significant difference(s) across regions/countries	41
Figure 14. Descriptive statistics of public health variables that showed significant difference(s) across regions/countries	42
Figure 15. Descriptive statistics of public health variables (access and use of public places and public transport) that showed significant difference(s) across regions/countries	42
Figure 16. Descriptive statistics for relatives professional leave across regions/countries.....	43
Figure 17. Descriptive statistics of day-to-day life variables that showed significant difference(s) across regions/countries	43
Figure 18. Descriptive statistics of living situation variables that showed significant difference(s) across regions/countries	44
Figure 19. Descriptive statistics of professional leave variables and needs of professional reorientation across regions/countries	44
Figure 20. Descriptive statistics of financial impact variables that showed significant difference(s) across regions/countries	45

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Appendix: Comparisons of the study variables between specific countries/regions

The Tables 14 to 16 show the detailed results of the cross-country/region comparisons as discussed in Section 3.2 respectively for the sample composition, crash circumstances and justice and insurance variables in Table 14, for medical, psychological and public health variables in Table 15, for personal life and for professional and economic situation variables in Table 16. Because the Belgian sub-sample was also included in the Western European sub-sample, two set of analyses were conducted separately for comparing Belgium, Denmark and the rest of the sample respectively and for comparing Denmark, Western Europe and the rest of the sample. Results of the statistical comparisons are presented in the penultimate column for the *Western Europe-Denmark-Rest of the sample* comparison (column entitled 'WEU-DK-R') and in the last column for the *Belgium-Denmark-Rest of the sample* comparison (column entitled 'BE-DK-R').

Table 14. Comparisons between specific countries/regions for sample composition, crash circumstances and justice and insurance variables

		Belgium	Denmark	Western Europe ³	Rest of the sample	Significance WEU-DK-R	Significance BE-DK-R
Sample Composition							
Gender	Female	41.8%	57.7%	50.0%	57.1%	<i>n.s.</i>	<i>BE<DK;R</i>
Age at time of the crash	25 or less	49.5%	33.2%	41.2%	40.3%	<i>n.s.</i>	<i>DK<BE</i>
	46-65	7.7%	26.9%	17.2%	16.8%	<i>n.s.</i>	<i>DK>BE;R</i>
Road user category	Four-wheeler	59.3%	44.7%	59.1%	70.0%	<i>R>WEU>DK</i>	<i>R>BE>DK</i>
	Powered Two-wheeler	8.8%	21.6%	16.8%	11.0%	<i>R<WEU<DK</i>	<i>DK>BE;R</i>
	Cyclist	13.2%	30.3%	12.4%	4.8%	<i>R<WEU<DK</i>	<i>DK>BE>R</i>
	Pedestrian	18.7%	3.4%	11.7%	14.3%	<i>R>WEU>DK</i>	<i>DK>BE;R</i>
Seriously injured	(Grade II)	84.0%	40.5%	75.3%	61.9%	<i>WEU>R>DK</i>	<i>BE>R>DK</i>
<i>Non-significant effects: Age, Age at time of the crash (26-45 and more than 65 groups), Time elapsed since crash</i>							
Crash circumstances							
Week day and time of day	Weekday daytime	47.3%	67.8%	56.2%	57.1%	<i>DK>WEU;R</i>	<i>DK>R;BE</i>
	Weekend at night	26.4%	6.7%	16.4%	11.7%	<i>DK<WEU</i>	<i>BE>DK;R</i>
Type of zone	Motorway	18.7%	8.7%	17.9%	17.2%	<i>DK<WEU;R</i>	<i>DK<R;BE</i>
	Rural	28.6%	30.8%	29.9%	22.7%	<i>DK;WEU>R</i>	<i>DK>R</i>
Causal factors	Human factors victims	41.8%	20.2%	28.8%	31.5%	<i>DK<WEU;R</i>	<i>BE>DK</i>
<i>Non-significant effects: Week day and time of day (Weekday at night and Weekend daytime groups), Type of zone (Urban/suburban), causal factors (Human factors opponent, Non-human factors)</i>							
Justice and insurance							
Went to court	Grade II severity	69.1%	30.4%	62.2%	67.1%	<i>DK<WEU;R</i>	<i>BE;R>DK</i>
Length of proceedings	Less than 1 year	4.9%	60.5%	15.2%	33.7%	<i>DK>R>WEU</i>	<i>BE<R<DK</i>
	1 to 3 years	36.6%	14.0%	31.3%	35.7%	<i>DK<R;WEU</i>	<i>DK<R;BE</i>
	More than 3 years	58.5%	25.6%	53.6%	30.6%	<i>DK;R<WEU</i>	<i>BE>R;DK</i>
Acceptable		14.6%	55.8%	28.6%	30.6%	<i>DK>R;WEU</i>	<i>DK>R;BE</i>
No Compensation¹	Grade II severity	46.6%	13.6%	37.8%	30.6%	<i>DK<R;WEU</i>	<i>BE;R>DK</i>
Unsatisfied with compensation²	Grade II severity	48.9%	31.8%	54.1%	58.3%	<i>DK<R;WEU</i>	<i>R>BE>DK</i>
<i>Non-significant effects: At fault, Went to court (Grade I), Court decision (charge fair, sentence fair, justice done), No compensation (Grade I), Unsatisfied with compensation (Grade I)</i>							

¹ Neither for injuries nor pain and suffering ; ² Somewhat or completely unsatisfied. ³ Western Europe composed in our study of 5 participating countries : The Netherlands, Germany, Belgium, Luxembourg and France.

Note. In the descriptive and comparison analyses, along with the considered countries/regions (i.e., Belgium (N=91), Denmark (N=208) and Western Europe (N=274)) data and comparisons with the rest of the samples were also considered. The rest of the sample includes data from the following countries: United-Kingdom, Ireland, Finland, The Czech Republic, Bulgaria, Romania, Spain, Portugal, Italy, Slovenia, Croatia, Greece, Malta and Cyprus (N=273).

Table 15. Comparisons between specific countries/regions for medical, psychological and public health variables

		Belgium	Denmark	Western Europe ³	Rest of the sample	Significance	
						WEU-DK-R	BE-DK-R
Medical consequences							
Full recovery	Grade I severity	N/A	41.4%	47.5%	70.9%	DK;WEU<R	N/A
	Grade II severity	16.2%	12.7%	16.1%	33.6%	DK;WEU<R	BE;DK<R
Mobility	Grade I severity	N/A	-1.58	-1.84	-1.06	R<WEU;DK	N/A
	Grade II severity	-3.50	-2.95	-3.37	-2.76	WEU>DK;R	BE>R;DK
Self-care	Grade I severity	N/A	-1.06	-1.75	-.81	WEU>DK;R	N/A
	Grade II severity	-3.47	-2.57	-3.23	-2.76	WEU>DK;R	BE>R;DK
Usual activities	Grade I severity	N/A	-2.26	-2.43	-1.41	R<WEU;DK	N/A
	Grade II severity	-3.64	-3.22	-3.59	-3.10	WEU>DK;R	BE>R;DK
Pain	Grade I severity	N/A	-2.40	-2.32	-1.39	R<WEU;DK	N/A
	Grade II severity	-3.15	-3.06	-3.18	-2.77	WEU>R	n.s.
Mental health	Grade I severity	N/A	-.69	-1.61	-1.26	DK<WEU;R	N/A
	Grade II severity	-1.83	-1.62	-2.10	-2.20	DK<WEU;R	DK<R
Cognitive functioning	Grade I severity	N/A	-1.52	-1.52	-.84	R<WEU;DK	N/A
	Grade II severity	-3.12	-2.38	-3.01	-2.07	WEU>DK;R	BE>R;DK
Non-significant effect: Number of injuries							
Psychological consequences							
PTSD	Grade II severity	48.4%	63.6%	57.9%	71.8%	WEU<R	BE<R;DK
Anxiety	Grade II severity	35.9%	50.6%	46.8%	56.5%	n.s.	BE<DK;R
Non-significant effects: PTSD (Grade I), Anxiety (Grade I), Depression							
Public health (On the whole, how would you rate the following public health facilities as proposed/offered in your country?)							
Medical treatment	Quality	4.15	3.77	3.95	3.39	WEU; DK>R	R<BE;DK
	Financial help proposed ¹	3.97	4.20	3.98	3.51	WEU; DK>R	R<DK
Mental health services	Quality	4.07	4.52	3.84	3.42	DK>WEU;R	R<BE;DK
	Financial help proposed ¹	3.99	4.40	4.12	3.72	DK>R	R<DK
Social services	Quality	4.19	4.19	3.92	3.20	WEU; DK>R	R<BE;DK
	Financial help proposed ¹	4.14	4.41	4.04	3.64	DK>R	R<DK
Technical/logistic help²	Quality	4.44	4.87	4.20	3.26	DK>WEU>R	R<BE;DK
	Financial help proposed ¹	4.28	4.88	4.15	3.64	DK>WEU>R	R<BE;DK
Access/use of public places		3.40	4.75	3.36	3.23	DK>WEU;R	DK>R;BE
Public transport		3.40	4.56	3.42	3.10	DK>WEU;R	DK>R;BE
Non-significant effect: Global satisfaction regarding treatment							

¹ Considering only financial help proposed by public institution and not from private, non-profit or informal organisations ; ² E.g. house adaptations. ³ Western Europe composed in our study of 5 participating countries : The Netherlands, Germany, Belgium, Luxembourg and France.

Note. In the descriptive and comparison analyses, along with the considered countries/regions (i.e., Belgium (N=91), Denmark (N=208) and Western Europe (N=274)) data and comparisons with the rest of the samples were also considered. The rest of the sample includes data from the following countries: United-Kingdom, Ireland, Finland, The Czech Republic, Bulgaria, Romania, Spain, Portugal, Italy, Slovenia, Croatia, Greece, Malta and Cyprus (N=273).

Table 16. Comparisons between specific countries/regions for personal life and for professional and economic situation variables

		Belgium	Denmark	Western Europe ¹	Rest of the sample	Significance WEU-DK-R BE-DK-R	
Impact on day-to-day, socio-emotional and family life							
Ability to fulfil responsibility	Grade I severity	N/A	2.83	2.76	2.15	DK>R	N/A
	Grade II severity	3.21	2.83	3.27	2.85	WEU>R;DK	n.s.
Impact on socio-emotional life	Grade I severity	N/A	1.99	2.19	1.69	R<WEU	N/A
	Grade II severity	2.68	2.25	2.83	2.36	WEU>R;DK	n.s.
Impact on family life/functioning	Grade I severity	N/A	2.32	2.83	1.95	R<WEU	N/A
	Grade II severity	3.38	2.95	3.35	2.96	WEU>R;DK	n.s.
Impact on relatives' professional life <i>At least one relative stop to work</i>	Grade I severity	N/A	9.9%	34.1%	20.0%	DK<WEU;R	N/A
	Grade II severity	12.1%	6.6%	17.3%	19.6%	WEU;R>DK	R>BE;DK
Non-significant effects: Impact on relatives' personal life, Impact on relatives' professional life (Grade II), At least one relative had to stop working to take care of you (Grade I)							
Impact on living situation							
Same as before	Grade II severity	48.3%	65.8%	44.7%	50.0%	DK>R;WEU	DK>BE,R
Housing adaptation	Grade II severity	13.8%	14.5%	16.0%	25.0%	R>WEU;DK	BE;DK<R
Had to Move	Grade II severity	37.9%	19.7%	39.3%	25.0%	WEU>R;DK	BE>DK
Non-significant effect: Impact on living situation (Grade I)							
Time off work/studies							
3 months or less	Grade I severity	N/A	44.0%	32.4%	66.1%	R>WEU;DK	N/A
	Grade II severity	3.9%	23.6%	4.7%	13.6%	WEU<R<DK	DK>BE;R
> 3 months	Grade I severity	N/A	50.5%	51.4%	25.8%	R<WEU;DK	N/A
Stop working/studies	Grade I severity	N/A	5.5%	16.2%	8.1%	WEU>DK	N/A
	Grade II severity	43.1%	18.1%	44.5%	33.0%	WEU>R>DK	DK<BE;R
Non-significant effect: More than 3 months time off work/studies (Grade II)							
Adaptations needed							
Reorientation	Grade II severity	60.7%	38.0%	65.8%	52.1%	WEU>R;DK	n.s.
Adapt work load	Grade I severity	N/A	59.7%	75.0%	31.9%	R<WEU;DK	N/A
Special accommodations	Grade I severity	N/A	50.0%	55.6%	9.3%	R<WEU;DK	N/A
No adaptation needed	Grade I severity	N/A	26.6%	14.7%	59.6%	R<WEU;DK	N/A
Non-significant effects: Reorientation (Grade I), Adapt work load (Grade II), Special accommodations (Grade II), No adaptation needed (Grade II)							
Financial income decrease							
Same as before	Grade II severity	31.0%	50.0%	37.3%	41.6%	DK>WEU	DK>BE
200 – 1000 euros	Grade II severity	48.3%	23.7%	34.0%	43.4%	DK<R	DK<BE;R
> 1000 euros	Grade II severity	20.7%	26.3%	28.7%	15.0%	DK;WEU>R	D>R
Non-significant effect: Financial income decrease (Grade I)							

¹Western Europe composed in our study of 5 participating countries : The Netherlands, Germany, Belgium, Luxembourg and France.

Note. In the descriptive and comparison analyses, along with the considered countries/regions (i.e., Belgium (N=91), Denmark (N=208) and Western Europe (N=274)) data and comparisons with the rest of the samples were also considered. The rest of the sample includes data from the following countries: United-Kingdom, Ireland, Finland, The Czech Republic, Bulgaria, Romania, Spain, Portugal, Italy, Slovenia, Croatia, Greece, Malta and Cyprus (N=273).

