BMJ Open Content analysis of reported activities of the United Nations Road Safety Collaboration Members during the Decade of Action for Road Safety 2011–2020

Sean Alan Flannigan ^{1,2} Meleckidzedek Khayesi²

To cite: Flannigan SA, Khayesi M. Content analysis of reported activities of the United Nations Road Safety Collaboration Members during the Decade of Action for Road Safety 2011–2020. *BMJ Open* 2021;**11**:e042409. doi:10.1136/bmjopen-2020-042409

► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2020-042409>).

Received 04 July 2020

Revised 30 December 2020

Accepted 18 January 2021

© Author(s) (or their employer(s)) 2021. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

¹Department of Emergency Medicine, University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, North Carolina, USA

²Department of Social Determinants of Health, World Health Organization, Geneva, Switzerland

Correspondence to

Dr Sean Alan Flannigan;
sean_flannigan@med.unc.edu

ABSTRACT

Objective Several activities were planned for the Decade of Action (DOA) for Road Safety 2011–2020, covering key policies and interventions on road safety. Knowledge of the activities implemented by key actors is currently lacking in the literature. This study answers the question: what activities were implemented during the DOA by the United Nations Road Safety Collaboration (UNRSC) members?

Design The study used content analysis techniques to extract and analyse information from five United Nations Secretary General's reports, which summarise the activities reported by UNRSC members.

Setting The primary setting for this study are 116 countries in which activities supporting the DOA were conducted.

Outcome measures Frequency of themes and subthemes that emerged from reported activities are identified and cross-tabulated by year of report, country level of income, geographical region and organisation type.

Results Over the entire DOA, establishment of institutions and lead agencies as well as the development of national strategies featured prominently under the theme of management. This theme was steadily reported across regions, country income level and organisation type. Workshops, training and major events regarding road safety increased in frequency of reporting throughout the decade as did developing and promoting the basic road and vehicle systems supportive of road safety. It is further noted that other key activities like infrastructure and behaviour change that are required for a balanced approach to road safety policy were also attended to by various organisations. Activities related to road safety enforcement and post-crash response as well as activities in low-income countries appeared to be less reported.

Conclusion The wide range of activities reported by UNRSC members over the entire DOA need to be sustained and evaluated in years to come if they are to have a significant impact on reducing road traffic deaths and injuries at national and international levels.

INTRODUCTION

What did United Nations Road Safety Collaboration (UNRSC) members do during the Decade of Action (DOA) for Road Safety

Strengths and limitations of this study

- To date, there is no comprehensive assessment of the activities implemented during Decade of Action (DOA) for Road Safety 2011–2020.
- Use of content analysis technique and Nvivo software provided a rigorous approach.
- The findings of the study are critical for the recently announced new DOA.
- A limitation of this study is that activities of United Nations Road Safety Collaboration members do not represent the full spectrum of DOA activities.
- Another limitation is that an in-depth investigation of selected activities by the authors was not possible, pointing to a future research topic.

2011–2020? During the DOA, several activities were implemented under a global plan of action aimed at stabilising and reducing the global trend in road traffic deaths and injuries.¹ They were organised under five groups or pillars related to road safety management, infrastructure, road users, vehicle safety and post-crash response, and were implemented by governments, non-governmental organisations, companies, foundations and international organisations. Additionally, several governments prepared action plans. Given that this was the first decade targeted at road safety, knowledge of the activities implemented, and their outcomes would be beneficial to future road safety policy.

Several editorials and journal articles describing the objectives and scope of the DOA were published at the beginning of the DOA.^{2–3} A few articles were also published during the DOA, pointing out its importance and providing an overview of progress being made during and prior to its inception.^{4–11} What is not known, however, are the activities that were implemented by governments,

non-governmental organisations (NGOs), international organisations and road safety coalitions like UNRSC as well as where these activities took place. Although some more regionally focused assessments of activities have been published,¹² to date, there is no comprehensive analysis of the activities of these groups conducted from a global context. Though a comprehensive database of these activities and plans from around the world is not available, there is a track of the activities that were reported by members of UNRSC. Examining the activities that were described by this group helps to shed light on the scope of work that was done. The objective of this study is to examine activities that various actors across the organisational spectrum including international agencies, NGOs, foundations, governments, academia and the private sector reported throughout the DOA. This study analyses the content of five progress reports on DOA that were submitted by the United Nations Secretary General to the United Nations General Assembly.^{13–17} These reports are comprised of valuable information on various actions undertaken and reported by different members of UNRSC. The analysis in this study focuses on the patterns in themes of reported activities covered in these reports.

METHODS

Study design

This study used content analysis techniques^{18–23} to extract and analyse information on the activities of international agencies, non-governmental organisations, foundations, governments, members of academia and the private sector affiliated with the UNRSC. Thematic content analysis was chosen because the focus of the study was on showing the patterns in the themes of activities reported by UNRSC members. We were also interested in conducting textual and discourse analysis which was ultimately omitted because the text presenting activities demonstrates a basic ‘standard’ statement indicating organisation, activity conducted and venue of activity.

Data collection and processing

We started off by reading the five reports to gain an overall sense of the content and themes covered. We discovered that the activities were reported according to a standard format, which made it possible to compare them across the years. The text was then broken down into identified activities. Using a manual open coding process,²⁴ we labelled each activity mentioned in the five reports as meaning units. Corresponding meaning units were then condensed into codes that were derived using an inductive reasoning approach as they emerged and were suggested by the text. This iterative process allowed us to effectively analyse the information presented.

The original text was re-read alongside identified codes and re-classified. This process was repeated five times to refine the codes to eliminate overlap and misclassification as well as to facilitate analysis and interpretation as required in qualitative research.^{25–27} As it happens with

thematic content analysis, the codes are grouped into several themes, and with further analysis, the thematic groups become fewer.²⁸ We originally identified 24 overarching themes from manual classification. With NVivo software, we narrowed the themes from 24 to 11 overarching themes, which we narrowed down further to five after we eliminated overlapping categories and calculated the salience (table 1).

In addition to the variety of meaning units and subsequent thematic groups highlighted in our manual open coding process, several cases were identified in the United Nations Secretary General reports. Cases were defined as primary actors executing or supporting activities or as subjects being acted on during the DOA. Each theme was then connected to one or more defined cases which could represent a country, an organisation or other actor. In this context, ‘activities’ correspond to one or more cases depending on how many subjects were connected to the said meaning unit in the text. We consider each reported activity to have been executed or supported by at least one reporting agency. Thus, the counts of activities that we present and discuss in this study are not abstract ideas but real activities that these entities indicated to have supported or implemented as part of their efforts to realise the goals of the DOA global plan.

We omitted the introduction, conclusion and recommendations sections of each report during this process as they did not contribute to tangible activities reported or conducted during the DOA. Given the amount of raw text to process, we used a qualitative data analysis software package known as NVivo to aid in creating a database for extraction and analysis of relevant information.^{29–30} The total word count for the entire text for the five reports that we coded was 30 865 words.

Data analysis

We determined the degree of salience to establish the proportion of the entire text taken up by each theme as coded text.^{31–32} It helps in determining emphasis given to themes or concepts in the document thereby further improving clustering performance.^{31–32} Salience statistics were derived based on the percentage of text the thematic codes took up in each of the five documents. A cut-off of 5% was used for exploratory analysis.

We chose country level of income, geographical region and organisation type as markers to examine the data on what was done during the DOA. There continues to be a strong association between the risk of road traffic death and the income level and region of countries.³³ With this in mind, we chose to analyse activities by country level of income and region in order to identify any potential variation in themes that may be contributing to these disparities. Organisation type was chosen in order to explore the different actors involved in the DOA. Analysis of variance (ANOVA) was conducted to determine whether the observed variance within and between groups was statistically significant.

Table 1 Themes and subthemes coded from United Nations Secretary General reports

Themes and subthemes	Description	Frequency	Average salience score (%)
Management	Activities related to planning, coordinating, facilitating, collaborating/creating multisectoral partnerships, launching programmes, establishing institutions/lead agencies, strengthening capacity, preparing national plan/strategy, etc, in support of road safety policies	119	7.6
Progress	Noteworthy establishment, growth and commitment of DOA affiliated organisations in addition to newly launched initiatives	45	3.1
Funding	Encouraging and sourcing increased financial support and capital	31	1.8
Strategy	Strengthening the capacity and execution of the DOA through the development of national strategies, lead agencies and resolutions	23	1.3
Technical assistance	Provide professional support to institutions and governments	8	0.5
Collaboration	International collaboration and inclusion regarding the issues of road traffic safety and injury prevention as well as creation of multisectoral partnerships	6	0.6
Policy instruments	Create policy instruments for implementation by countries	6	0.4
Infrastructure	Developing and promoting the basic systems supportive of road safety	98	7.3
Roads	Improved road infrastructure, safety, and planning as well as systematic risk rate mapping, performance tracking and safety rating using objective data	44	2.5
Vehicles	Improvement in safety features of vehicles as well as harmonising safety standards of vehicles on a global scale	38	3.3
Crash care	Promoting improved rapid road traffic injury response and universal trauma systems	16	1.5
Behaviour change	Programmes aimed to improve the safety of drivers and vulnerable populations through legislation and enforcement campaigns that meets best practices, supported by campaigns and advocacy	94	6.3
Advocacy	Public support and awareness campaign for a particular cause or policy related to road traffic safety	47	3.3
Children	Programmes and legislation for child safety and protection	20	1.7
Helmets	Programmes and legislation introduced to regarding helmet use as well as access and availability of helmets	11	0.6
Substance abuse	Programmes and legislation introduced to decrease driving under the influence	8	0.6
Seatbelts	Programmes and legislation introduced to encourage and enforce the use of seatbelts	5	0.3
Distracted driving	Programmes and legislation introduced to decrease distracted driving	4	0.3
Speed	Programmes and legislation introduced to decrease speeding	4	0.3
Enforcement	Increased general enforcement or road safety policy	3	0.2
Information	Collection and dissemination of data and information through technical reports, guidelines, scientific articles, conducting research and sharing experiences	93	5.9
Data	Improved quality and performance of data collection and distribution	37	3.1
Research	Significant investigations and studies undertaken and/or published	30	0.8
Shared guidelines	Shared standards, recommendations and strategies for nations to follow in implementing goals of the DOA	23	1.7
Shared knowledge	Sharing experience and information with other organisations or nations in order to improve global road traffic outcomes	7	0.6
Meetings	Conferences, national and regional workshops/trainings and major events on road safety	92	6.8

Continued

Table 1 Continued

Themes and subthemes	Description	Frequency	Average salience score (%)
Workshop	National and regional workshops or trainings held to improve road safety	45	3.6
Conference	A formal meeting for discussion regarding road traffic safety	37	2.5
Event	Major event hosted in order to further the goals of road safety	10	0.7
Total		496	—

Patient and public involvement

Patients and the public were not involved in the design of this study. As already indicated, the study uses information that already exists.

RESULTS

As shown in [table 1](#), 496 activities were reported to have been implemented and/or supported in different parts of the world. The activities are presented under five key themes identified: meetings, information, management, behaviour change and infrastructure. Under each theme, the activities are analysed further into subthemes.

Themes by year of reporting

The first half of the DOA exhibited a steady rate of overall activity whereas an upward trend in reporting was seen throughout the second half. The identified themes of management and information featured prominently throughout the DOA. It is evident that the frequency of meetings and investment in infrastructure reported in the Secretary General's progress reports trended up. Programmes to enhance behaviour, information dissemination and managerial oversight seemed to remain steady throughout the DOA with a dip in activity reported in 2015 ([table 2](#)). ANOVA revealed that the thematic pattern observed was not statistically significant.

Themes by country level of income

[Table 3](#) presents the pattern of activities reported in the Secretary General reports by country level of income. High-income countries were defined as having a gross national income (GNI) per capital exceeding \$12 375; whereas, middle-income nations were defined as having a GNI per capital between \$1025 and \$12 375. Low-income

nations were defined as having a GNI per capita of less than \$1025.³⁴ A table characterising the 116 nations reported to have been sites for activities described in the Secretary General's progress reports by level of income and region can be found in online supplemental appendix 1. Most of the activities performed throughout the DOA were associated with middle-income countries. In fact, over 86% of middle-income nations were involved in the DOA in some way. It is also noted that almost half of the world's low-income countries, whose average rate of 27.5 deaths per 100 000 populations,³³ were included in the DOA. Many of these nations engaged in management activities related to establishing lead agencies, strengthening capacity and preparing national strategy in support of road safety policies. It is evident, however, that more work could be put into building and investing in the infrastructure of these low-income nations as well as data collection and dissemination. ANOVA revealed that the thematic pattern observed was not statistically significant.

Themes by geographical regions

We explored the relationship between reported themes and geographical region in [table 4](#). Extensive work was reported to be done in Asian and the Pacific countries throughout the decade, most notably in the implementation of programmes aimed to improve driver behaviour and increase the safety of vulnerable populations. Furthermore, Asian and Pacific countries made great strides in strengthening management of the DOA. African countries similarly made great advances in activities related to establishing lead agencies, strengthening capacity and preparing national strategy in support of road safety policies as well as improving legislation and enforcement. Conferences, workshops and major events related to road safety seemed to be attended by all regions; whereas, reporting on data collection and dissemination seemed to be lacking in most regions other than high-income western nations. Developing improved driver infrastructure seemed to be limited to high-income western nations as well as in Asia and the Pacific. Observed variation in thematic groups by geographical region were in fact statistically significant as ANOVA of the relationships presented in [table 4](#) revealed a p value of 0.015.

Themes by organisation type

Further investigation into activities reported as having been implemented by different organisation genres

Table 2 Frequency of identified themes by year of reporting

Theme	2011	2013	2015	2017	2019	Total
Behaviour	20	19	18	15	22	94
Information	20	14	15	26	18	93
Management	25	18	9	35	32	119
Meeting	8	14	16	30	24	92
Infrastructure	7	15	22	31	23	98
Total	80	80	80	137	119	496

Table 3 Frequency of identified themes by income level of country

Theme	High income* (n=32)	Middle income† (n=70)	Low income‡ (n=14)	Total
Behaviour	12	25	7	44
Information	6	5	1	12
Management	5	26	15	46
Meeting	12	32	6	50
Infrastructure	10	14	0	24
Total	45	102	29	176

*High-income countries were defined as having a gross national income (GNI) per capital exceeding \$12375.

†Middle-income nations were defined as having a GNI per capital between \$1025 and \$12375.

‡Low-income nations were defined as having a GNI per capita of less than \$1025.

throughout the DOA was conducted to identify any thematic patterns among organisational actors (table 5). A significant fraction of the DOA Secretary General's Reports described the works of international agencies and United Nations affiliates. NGOs reported most activities on improving driver behaviour primarily through advocacy and public awareness campaigns as well as introducing programmes to promote child safety and protection. Nationally run organisations particularly reported mainly hosting workshops and trainings aimed at improving road safety. Funding was largely dominated by United Nations affiliates and the private sector. However, the private sector appeared to be less involved in other aspects of the decade compared with other organisation types. ANOVA revealed that the thematic pattern observed was not statistically significant.

DISCUSSION

This study has identified patterns in reported activities by UNRSC members consisting of international agencies, non-governmental organisations, foundations,

governments, members of academia and the private sector during DOA. Achieving global and national road safety goals and targets requires appropriate management capacity and is essential to implementing effective, system-wide interventions.¹³⁵ Consequently, the theme of management had the highest number of overall activities related to creating multisectoral partnerships, launching programmes, establishing lead agencies, strengthening capacity and preparing national strategies. This theme was reported frequently in all five Secretary General reports published during the DOA. The decline in managerial support reported in 2015 appears to be secondary to a temporary decrease in establishment of national strategies, lead agencies and institutions. Furthermore, this theme seemed to be a highly engaged activity across national income levels, regions and organisation type. As low-income nations report an average rate of 27.5 deaths per 100 000 populations,³³ it is reassuring to see the increasing establishment of lead agencies and national strategies in these countries. Furthermore, the rates of motor vehicle deaths are highest in the African (26.6/100 000 people)

Table 4 Frequency of identified themes by geographic region

Theme	Africa (n=25)	Asia/Pacific (n=35)	Europe/Other* (n=34)	Latin America/Caribbean (n=22)	Total (n=116)
Behaviour	11	19	13	9	52
Information	1	1	6	4	12
Management	16	18	11	12	57
Meeting	12	18	16	9	55
Infrastructure	3	11	19	7	40
Total	43	67	65	41	216
Results of ANOVA					
Sources of variation	SS	Df	MS	P value	F crit
Between groups	347.7	4	86.925	0.015	3.056
Within groups	295.5	15	19.7		
Total	643.2	19			

*Europe and Other category includes Australia, Canada, New Zealand and the United States in addition to western and eastern Europe. ANOVA, analysis of variance; MS, Mean squares; SS, Sum of squares.

Table 5 Frequency of identified themes by organisation genre

Theme	Academia (n=17)	Foundation (n=13)	International agencies (n=51)	United Nations affiliate (n=40)	National organisation (n=39)	NGO (n=19)	Private sector (n=20)	Total (n=199)
Behaviour	3	4	10	11	8	14	3	63
Information	7	4	18	17	5	6	2	59
Management	3	12	20	25	5	7	24	96
Meeting	7	6	16	23	19	10	4	87
Infrastructure	3	4	14	13	6	4	2	46
Total	23	30	78	89	43	41	35	351

and southeast Asia (20.7/100 000 people) which reflects an increasing focus on institutional management within these regions.³³ Funding incorporated 26% of this heavily reported theme and suggests that the decade encouraged increased sustainable funding to road safety or there were additional donors who showed interest in road safety. In fact, according to the *Global status report on road safety 2018*, 132 countries reported having a national strategy for road safety fully funded while 129 countries have lead agencies funded.³³ The extent of this funding has yet to be assessed; however, our research shows that international funding was focused on low-income and middle-income countries in the African and Asian regions. Furthermore, we show that the private sector played a major role in financing the activities carried out throughout the DOA, particularly automotive companies, oil industry and tyre manufacturers.

Information and meetings had the second and third highest number of activities, respectively. Although the collection and dissemination of information through technical reports, guidelines, scientific articles, conducting research and sharing experiences were not heavily reported on in relation to national income level or region, analysis revealed that these activities were driven largely by international organisations and United Nations affiliates. Surprisingly, academic organisations were not widely reported of having conducted significant investigations and studies regarding global road safety which undoubtedly highlights an important partner to target moving forward into the upcoming decade. Under the theme of information, data collection emerged as an important activity conducted by UN affiliates as it comprised just under 50% of this given component with a steady frequency of reporting throughout the decade. It is encouraging to see an expanding global involvement in meetings regarding the DOA. Specifically, regarding this dramatic rise in reporting, workshops and trainings directed at improving road safety at multiple levels increased the most having been reported only once in 2011 and 17 times in 2019. The majority of national and regional workshops held to promote road safety were conducted in the middle-income nations in Africa, Asia and the Pacific. However, only two low-income nations

were reported to have been involved in these workshops, highlighting a significant need in these more at risk countries.

The theme of behavioural change was consistently reported throughout the DOA with a small dip in 2017. Advocacy campaigns and public relations proved to be one of the most reported activities of the decade and were exceptionally prevalent in middle- and high-income nations as well as Africa, Asia and the Pacific. These activities were critical in elevating the profile of road safety as an important health and development challenge globally, thereby revolutionising public attitudes and opening new avenues for UNRSC interventions. Additionally, enacting and enforcing legislation on key risk factors have been shown to be critical components of an integrated strategy to prevent road traffic deaths and injuries. Local NGOs and foundations led the promotion of programmes and legislation to support child safety and protection. However, most of the legislative progress reported in these biannual reports seem to be centralised around middle-income nations with much work still to be done in low-income nations. With the substantial expansion of lead agencies, national strategies and public relations as well as involvement in workshops and trainings, it is hopeful that greater legislative advances will be seen in low-income nations over the decade to come. Despite the significant progress made in improving behavioural legislation across multiple risk factors, enforcement remains markedly underreported, particularly in low-income and middle-income countries, at the end of the decade.

Investment and promotion of improved infrastructure started off slowly but appreciably increased throughout the decade. This rise in infrastructure reported was significantly driven by improved road planning and systematic road risk mapping as well as improvement in safety features of vehicles and harmonising safety standards of vehicles. Road safety inspections and the star rating of roads provide mechanisms to identify failings in infrastructure which can affect a crash likelihood and severity. The International Road Assessment Programme set out to achieve this in all regions of the world but appeared to work primarily with middle-income nations according to our analysis. Eastern Europe was under-reported in road

safety improvement reporting and vehicle safety progress. Meanwhile many activities regarding the advancement of harmonising vehicle safety standards and making safer vehicles more accessible were reported as having been implemented in Latin America and the Caribbean. Lastly, post-crash care and promoting improved rapid road traffic injury response and universal trauma systems saw a slow increase in reports throughout the decade but still seemed to be significantly under-represented given the fact that they compose a major pillar of the DOA. A broad and integrated approach to post-crash care and emergency response can save millions of lives and mitigate acute and chronic sequelae of motor vehicle collisions.^{36 37} Therefore, it is critical for UNRSC members to address this challenge and endorse more activities in this field over the decade to come.

LIMITATIONS OF THE STUDY

This study has four main limitations. The first is that there is an 8000-word limit for the Secretary General reports. This limit puts restriction on the number and scope of activities that the partners could report on. The partners are expected to provide a very brief text of activities they have conducted at global and regional levels, which is then edited by a focal point. What is then ultimately included in the final report is a negotiated text between the UNRSC members, the focal point and members of the secretariat who review and approve the drafts. Given this process of inclusion, it is possible that reported activities may be underestimated.

The second limitation is that activities analysed are not representative of all DOA initiatives. Further, activities are not representative of all organisations, regions and countries. Activities coded and analysed are limited to those reported by members of the United Nations Road Safety Collaboration. Whereas these members execute and support activities in different parts of the world, they cannot be assumed to be able to report on activities implemented by those who are not affiliated with this network. There are very few activities reported by governments in the coded text. Hence, a comprehensive picture and a database of activities implemented during the DOA cannot be provided.

The third is that verification and a follow-up on a few key activities has not been conducted. Background documents against which to verify the reported activities were not available. Furthermore, there was not enough time for these authors to follow-up with individual UNRSC members to get details on a few key activities that they felt could have been tracked over the years to assess implementation reality and outcomes at national and subnational levels. This limitation represents an aspect that requires consideration in future research on this or the new DOA for Road Safety 2021–2030 that has recently been announced.

Lastly, an important issue in research is attribution.³⁸ While we have been able to summarise and even count

the number of activities reported by UNRSC members, we have not been able to ascertain from the Secretary General's progress reports which of these activities were going on before the decade and which ones started during the decade. We cannot rule out that several activities were implemented during the decade but at the same time, we must point out that assessing and interpreting the decade through patterns in activities that have occurred during the decade period should be done with care, recognising that these changes may not solely be due to the Decade itself but might have only happened at the same time.

CONCLUSION

This study set out to examine the reported activities implemented by UNRSC members throughout the DOA. Since the launch of the DOA, the establishment of institutions and lead agencies as well as the development of national strategies has been consistently implemented and supported as shown by the strong representation of management reporting in all five of the reports. Additionally, this activity has been steadily reported across regions, income level and organisation type. Advocacy, workshops, training and major events regarding road safety increased in frequency of reporting throughout the decade as did developing and promoting the basic road and vehicle systems supportive of road safety. However, road traffic enforcement and post-crash care have low frequencies. Furthermore, activities conducted in low-income countries appeared to be fewer. Monitoring the activities that were conducted and reported throughout the DOA is important as it will help guide improvements in road safety policy over the upcoming decade.

Acknowledgements We are grateful to Margie Peden and Adnan Hyder for comments on an earlier draft of this manuscript. We also thank the World Health Organization for granting SF an internship in May–August 2019 that enabled him to work on this project. We thank Joëlle Auer for availing the reports that we used as the primary data for this study.

Contributors MK conceptualised the study, SF extracted and analysed data and both MK and SF jointly wrote the text through a consultative approach with each refining the text as it took shape.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval Being a component of DOA evaluation, ethical approval for this study was obtained from George Washington University and University of Oxford, the home institutions for the principal investigators, Professor Adnan Hyder and Dr Margie Peden, respectively.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information. All relevant data have been included in the article. ORCID iDMeleckidzedek Khayesi: 0000-0002-2335-4077Sean Flannigan: 0000-0002-5042-7526

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content

includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

Sean Alan Flannigan <http://orcid.org/0000-0002-5042-7526>

REFERENCES

- World Health Organization. *Global plan for the decade of action for road safety 2011–2020*, 2011.
- Peden M. UN General assembly calls for decade of action for road safety. *Inj Prev* 2010;16:213.
- Krug E. Decade of action for road safety 2011–2020. *Injury* 2012;43:6–7.
- Bhatti JA, Salmi L-R. Challenges in evaluating the decade of action for road safety in developing countries: a survey of traffic fatality reporting capacity in the eastern Mediterranean region. *Traffic Inj Prev* 2012;13:422–6.
- Koehlmoo TP. Why aren't we listening yet? A decade of road safety begins quietly. *PLoS Med* 2013;10:e1001464.
- Dagal A, Greer SE, McCunn M. International disparities in trauma care. *Curr Opin Anaesthesiol* 2014;27:233–9.
- Evaniew N, Godin K, Schemitsch EH, et al. Evidence gaps in the global decade of road traffic safety. *J Orthop Trauma* 2014;28 Suppl 1:S15–17.
- Ernstberger A, Joeris A, Daigl M, et al. Decrease of morbidity in road traffic accidents in a high income country - an analysis of 24,405 accidents in a 21 year period. *Injury* 2015;46 Suppl 4:S135–43.
- Hyder AA, Paichadze N, Toroyan T, et al. Monitoring the decade of action for global road safety 2011–2020: an update. *Glob Public Health* 2017;12:1492–505.
- Nazif-Muñoz JI. Did child restraint laws globally converge? Examining 40 years of policy diffusion. *Traffic Inj Prev* 2015;16 Suppl 2:S32–40.
- Nazif Munoz J. I. Inequity on the roads: the interplay of global, regional and national forces on traffic fatalities, injuries and accident severity, 2016. Available: <https://escholarship.mcgill.ca/concern/theses/4f16c547s?locale=en>
- Pérez-Salas G, Nazif JI. Performance of Latin America and the Caribbean during the first years of the decade of action for road safety. *fal Bulletin*. p342, 2015. Available: <https://www.cepal.org/en/taxonomy/term/8136/34680>
- World Health Organization. United nations General assembly: improving global road safety, 2011. Available: https://www.who.int/roadsafety/about/resolutions/sept_2011_sg_report_en.pdf?ua=1
- World Health Organization. United nations General assembly: improving global road safety, 2013. Available: https://www.un.org/ga/search/view_doc.asp?symbol=A/68/368
- World Health Organization. United nations General assembly: improving global road safety, 2015. Available: https://www.who.int/roadsafety/about/resolutions/download/UNSG_Report_70_386_English.pdf?ua=1
- World Health Organization. United nations General assembly: improving global road safety, 2017. Available: https://www.who.int/roadsafety/about/resolutions/download/UNSG_Report_72_359_EN.pdf?ua=1
- World Health Organization. United nations General assembly: improving global road safety, 2019. Available: <https://www.who.int/roadsafety/about/resolutions/download/A-74-304-EN.pdf?ua=1>
- Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* 2004;24:105–12.
- Mayring P. Qualitative content analysis. *Forum Qual Soc Res* 2000;1 <http://www.qualitative-research.net/fqs/>
- Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res* 2005;15:1277–88.
- Schilling J. On the pragmatics of qualitative assessment: designing the process for content analysis. *Eur J Psychol Assess* 2006;22:28–37.
- Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs* 2008;62:107–15.
- Krippendorff K. *Content analysis: an introduction to its methodology*. Thousand Oaks, CA: Sage, 2013.
- Berg BL. *Qualitative research methods for the social sciences*. Boston: Allyn and Bacon, 2001.
- Yin RK. *Case study research: design and methods*. Los Angeles: Sage, 2009.
- Punch KF. *Introduction to Social Research: Quantitative & Qualitative Approaches*. Los Angeles: Sage, 2014.
- Chatwin Met al. Defining subnational open government: does local context influence policy and practice? *Policy Sciences* 2013.
- Waller Vet al. *Qualitative social research: contemporary methods for the digital age*. London: Sage, 2016.
- Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008;8:45.
- Howell Major C, Savin-Baden M. *An introduction to qualitative research synthesis: managing the information explosion in social science research*. Routledge, Oxon, UK, 2010.
- Escoter L. Grouping business news stories based on salience of named entities. *Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics: Volume 1*; April 3–7, Valencia, Spain, 2017:1096–106.
- Indunietz J, Gillick D. A new entity salience task with millions of training examples. *Proceedings of the European Association for Computational Linguistics, Association for Computational Linguistics*, 2014.
- World Health Organization. *Global status report on road safety 2018: summary*. Geneva, 2018.
- "World Bank Country and Lending Groups." World Bank Country and Lending Groups – World Bank Data Help Desk. Available: <datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>
- Peden M, Scurfield R, Sleet D, et al. *World report on road traffic injury prevention*, 2004.
- Farmer CM, Wells JK. Effect of enhanced seat belt reminders on driver fatality risk. *J Safety Res* 2010;41:53–7.
- Durbin DR, Elliott MR, Winston FK. Belt-positioning booster seats and reduction in risk of injury among children in vehicle crashes. *JAMA* 2003;289:2835–40.
- Booth WC, Colomb GG, Williams JM. *The craft of research*. Chicago: The University of Chicago Press, 1997: 48. 127.