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**Potentials of data linkages from civil registration and vital statistics and other systems in advancing the Sustainable Development Goals: the case of road safety**

*Conference Theme: Innovative Civil Registration and Vital Statistics System: Foundation for Legal Identity Management*



**APAI-CRVS**  
Everyone visible in Africa

**Decade for Repositioning of Civil Registration and Vital Statistics in Africa 2017-2026**



**CENTRE OF EXCELLENCE for CRVS Systems**





## I. Introduction

1. The significant need for better data to monitor the Sustainable Development Goals prompted African Ministers at the Fourth Conference of Ministers Responsible for Civil Registration and Vital Statistics to reaffirm their commitment to address civil registration and vital statistics (CRVS) issues within the context of the African Union Agenda 2063 and the 2030 Agenda for Sustainable Development; to reiterate their obligation to improve the recording of causes of death and the linkages between the health sector and CRVS systems in Africa; and to collaborate with other ministries responsible for CRVS systems with a view to promoting the reliability of health statistics.<sup>1</sup> Monitoring Sustainable Development Goal target 3.6, which aims to halve the number of global deaths and injuries from road traffic accidents by 2020, provides an opportunity not only for inter-sectoral collaboration among government-led institutions, but also to link with the private sector and civil society in campaigning for safer roads, providing emergency response and insurance coverage.

## II. Situation

2. Road crashes kill 1.35 million people every year and leave tens of millions more injured or disabled.<sup>2</sup> Road traffic injury death rates in Africa are the highest in the world. The number of deaths from road crashes in Africa account for 23 per cent of all deaths from road crashes in the world, although the continent only accounts for 16 per cent of the world population and 4 per cent of registered vehicles. Road traffic injuries present a major obstacle to development efforts in the region, since most of these deaths occur in young age-groups and those who survive could suffer from a range of long-term disabilities.

## III. Severe data gaps

3. The African region not only has the highest road traffic death rates per 100,000 population (namely 25 per 100,000, as shown in the figure below), but it is also where there are the largest discrepancies between the official figures on deaths from road crashes (around 71,000), as reported by States, and the estimated number of 306,000 such deaths, generated by the World Health Organization. Where CRVS systems are strong, their data are considered a gold standard for information on any cause of death, including from road traffic crashes. However, in Africa, fewer than 10 countries have fully-functional CRVS systems capable of producing adequate cause-of-death data. Where CRVS systems are weak, there is a need to reconcile various data sources on road traffic deaths in order to ascertain how many people die and what they die from. Modelling techniques are used to estimate the number of deaths from road crashes.

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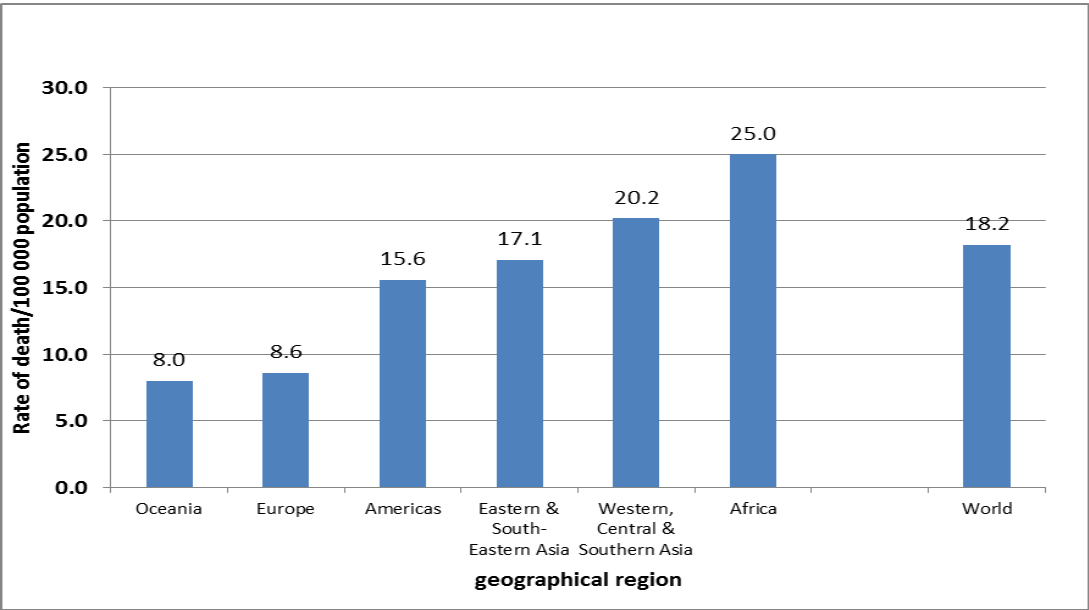
<sup>1</sup> Nouakchott Declaration, available at:

<http://apai-crvs.org/sites/default/files/public/Nouakchott%20Declaration%20-%20Dec2017-English.pdf>.

<sup>2</sup> *Global Status Report on Road Safety 2018*, World Health Organization.

See [www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/2018/en/](http://www.who.int/violence_injury_prevention/road_safety_status/2018/en/).

### Rates of road traffic death per 100,000 population by geographical region, 2016



#### **IV. Data sources on road traffic fatalities**

4. A multitude of stakeholders can be reached following a road traffic crash. Some generate data by recording information that is relevant to their respective domains or responsibilities, while others are users of this information.

##### *Public sector*

(a) Police officers are often the first to be at the scene of a road traffic crash. They are generally obliged by law to complete a record for each crash with details of the victims and their counterparts in the crash, including their identities and the circumstances and location of the crash. However, resource constraints mean that they are unable to attend or document every serious crash.

(b) Emergency health-sector staff: on the scene to attend to the injured.

(c) The judicial authority: called if there is suspicion that the crash was intentional.

(d) The medico-legal authority (coroner or medical examiner): may be mandated to assess the cause of death, in cases of unnatural causes, whether intentional or unintentional.

(e) Local authority: authorized community leaders or local health facilities that issue a burial permit to dispose of the body.

(f) Mortuaries and cemeteries: arrange for the storage and burial of the body as appropriate.

(g) Civil registration office: issues the death certificate.

(h) The road authority in charge of road infrastructure and safety: investigates and evaluates the lack or effectiveness of the road safety measures at the site of the crash.

##### *Private sector*

(a) Funeral homes: keep a record of the deceased for funeral services.

(b) Insurance companies: use information to process claims for damages to car and for life insurance.

(c) Civil societies: advocate for road safety measures in areas with recurrent or high rates of crashes, based on the evidence.

5. The primary sources of information on road traffic deaths are the police and civil registration sector. Other institutions or users may use a combination of other sources of information for their own purposes.

#### **V. Data linkages**

6. As information on a deceased person could potentially end up in several registers or databases, there are potential gains in pooling the information. However, the databases should be designed with common variables to enable these linkages. Reconciling data from these various sources would provide more realistic figures of road traffic fatalities. Probabilistic

matches could be made by using information such as the name of the deceased; his or her sex, age, date of birth and date of death; and the place and date of the crash. However, there will always be instances where, because of data entry errors or missing information, the matches will entail a certain level of uncertainty depending on how many variables have exact matches. Where national identification that is universal is implemented, it is the ideal means to record matches. National identification should, in principle and by default, appear on all administrative papers. In reality, police, hospital, insurance and medico-legal records may not routinely include national identification. Moreover, such information may not serve any administrative purpose.

## **VI. Benefits of linkages between civil registration and vital statistics and other data**

7. Linking data from various sources such as police, health facilities, mortuaries, burial grounds, health and accident insurance companies with civil registration is a low-risk high-yield opportunity for countries. It has been demonstrated to be extremely useful in several published studies.<sup>3 4 5 6 7</sup> National or subnational road traffic death counts from linked sources can be more effectively used for intervention planning and monitoring than modelled estimates. With the appropriate regulatory framework, national identification can be used as a means to link together these various sources of road safety data. These should then be considered in the monitoring of road safety and Governments should consider the potential of using such linked data to fulfil their Sustainable Development Goals reporting requirements on road safety.

## **VII. Use of linkages to improve primary data**

8. In countries with fully functional CRVS systems, vital registration data on road traffic deaths are more complete than police data because it is compulsory to register deaths before burials. However, vital registration data could suffer from under-registration and, where deaths are registered, the cause could be misclassified because of the way in which doctors complete their medical certificates. For example, frequently the nature of an injury, such as a hemorrhage, is recorded, but the cause of the injury, such as a car crash is not mentioned. In such cases, the cause of death is recorded in a category marked “unknown external causes of injuries”. Establishing a record linking vital registration data with police data would allow the reassignment of some misclassified deaths caused by road traffic crashes. In general, the police may fail to follow-up on a seriously injured crash victims who subsequently die from their injuries. Police records may also systematically under-report certain types of crash victims, including children, pedestrians and cyclists.<sup>8 9</sup> Death certificates from civil registration are better

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<sup>3</sup> Watson A., B. Watson and K. Vallmuur, Estimating under-reporting of road crash injuries to police using multiple linked data collections, Elsevier Ltd., 2015.

<sup>4</sup> Mandacaru PMP and others, Qualifying information on deaths and serious injuries caused by road traffic in five Brazilian capitals using record linkage, Elsevier Ltd., 2017.

<sup>5</sup> Short J. and B. Caulfield, Record linkage for road traffic injuries in Ireland using police hospital and injury claims data, National Council and Elsevier Ltd., 2016.

<sup>6</sup> Abegaz, T. and others, Road Traffic Deaths and Injuries Are Under-Reported in Ethiopia: A Capture-Recapture Method, PLOS ONE, 23 July 2014.

<sup>7</sup> Wilson SJ, DJ Begg and A. Samaranayaka, Validity of using linked hospital and police traffic crash records to analyse motorcycle injury crash characteristics, Elsevier Ltd., 2011.

<sup>8</sup> Watson A., B. Watson and K. Vallmuur, Estimating under-reporting of road crash injuries to police using multiple linked data collections, Elsevier Ltd., 2015.

<sup>9</sup> Short J. and B. Caulfield, Record linkage for road traffic injuries in Ireland using police hospital and injury claims data, National Council and Elsevier Ltd., 2016.

instruments for capturing all road traffic deaths, including those that occur within one year of the crash. It is therefore not surprising that the number of deaths recorded by the police are lower than those recorded by civil registration systems, when those systems are strong. In both scenarios mentioned above, there are benefits to linking police and civil registration in order to arrive at a more realistic picture of road crash fatalities and help to identify gaps that need to be addressed in both systems.

### **VIII. Contribution from other sectors to improving data linkages**

9. The private sector is a potential user of combined data. In some countries, private health insurance companies organize the post-crash response. In such cases, the companies need to gather evidence before processing claims for car damages or life insurance. Evidence could be provided by the police or the family of the deceased. But the companies would request more detailed sociodemographic or health-related information before issuing an insurance policy to a person. Information gathered by insurance companies could also help to elucidate unmatched records between vital registration and police data. The authorities in Thailand for example have used insurance, police and vital registration data to arrive at a better estimate of their road traffic fatalities.<sup>10</sup> Similarly, data linkages could also be made at more local levels using administrative records from burial grounds and religious registers. Civil societies advocating for road safety generally keep records of deaths on identified roads to raise the awareness and put pressure for proper preventive interventions to be set up. These records could also contribute to better knowledge of road traffic fatalities.

### **IX. Civil registration sector as a beneficiary of data linkages**

10. Apart from their administrative use, police records could potentially be used to facilitate notification and registration of deaths by civil registration offices, particularly in low-resource settings where the registration of vital events is low. The proportion of deaths from non-natural causes, including road traffic crashes, can be as high as 20 per cent of all total deaths in a country.<sup>11</sup> Police records would therefore act as “enablers” to increase death registration and improve the documentation of cause of death. Families of the deceased could then obtain a death certificate, the legal document that would allow them to access their rights to social benefits such as widow and orphan allowance as well as inheritance. At the government level, knowing that a person is no longer alive would allow the authorities to make necessary amendments or take necessary action regarding the deceased’s national identification record, pension and electoral card.

### **X. Advocating for strong civil registration and vital statistics systems**

11. The growing momentum in addressing the road safety agenda has highlighted the crucial need to strengthen CRVS systems that could provide evidence to the African Road Safety Observatory, which was recently established by regional and international partners and civil societies engaged in road safety to better monitor progress in the region and help Governments with their developing action plans. The African Road Safety Forum held in November 2018 in Marrakech, Morocco, issued a declaration to encourage countries to prioritize the development of their CVRS, for better data on road traffic deaths.<sup>12</sup> Without complete and reliable information on where, when and how people are killed on African roads, interventions

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<sup>10</sup> See <http://rti.ddc.moph.go.th/RTDDI/Modules/Report/Report11.aspx>.

<sup>11</sup> World Health Organization Global Health Estimates. See [www.who.int/healthinfo/global\\_burden\\_disease/estimates/en/](http://www.who.int/healthinfo/global_burden_disease/estimates/en/).

<sup>12</sup> See Marrakech Declaration, 2018: [www.arsforum2018.ma/storage/app/media/pdf/Marrakech-declaration.pdf](http://www.arsforum2018.ma/storage/app/media/pdf/Marrakech-declaration.pdf).

cannot be properly designed and enforced in locations where they are the most needed to prevent future deaths. The survivors of road traffic crashes may suffer from economic loss as a result of physical injuries that impair their continued ability to work. They may also require care and services to help them live with the disabilities. The burden from road traffic crashes inevitably has financial and operational implications for the health sector.<sup>13</sup> As CRVS systems are meant to collect mortality data on a routine and continuous basis to the lowest administrative level, such data are the ideal source for geographically locating areas with high mortality rates from road traffic crashes and monitoring the efficacy of the road safety interventions put in place.

12. Both police and civil registration systems operate within a legal framework to identify deaths and their causes and their information contributes to country vital statistics. As they generally fall under different ministries, each one produces its own statistics on road traffic crashes according to its protocols, sometimes ignoring other data sources or collaboration with other sectors. It is worth noting that half of the participating countries in the latest *Global Status Report on Road Safety* used only police data to report on their road traffic statistics. All types of data, CRVS or police, should be critically reviewed for their strengths and in particular for their weaknesses. Bringing all these data together, critically reviewing them and reconciling differences, is a major step towards improvement. Monitoring road crash fatalities reflects the multi-sectoral approach that countries need to consider for the mutual benefits to all sectors involved. It requires collaborative efforts and engagement from the sectors but the long-term benefits would be substantial in terms of generating better evidence on road traffic fatalities, leading to better investments in safer roads. Ultimately, this would save lives and reduce the social burden of road traffic injuries on society.

## **XI. Issues for discussion**

13. In the light of the above, the following questions could help to frame the discussions:

(a) Countries should broaden their stakeholders to improve the scope and quality of their vital statistics. In the context of the Sustainable Development Goals, in particular for road traffic fatalities, what type of coordination mechanisms have countries put in place among the key stakeholders?

(b) How do countries envisage using all available data sources to help their policy makers monitor road traffic deaths and support interventions to curb the death toll?

(c) National identification is the ideal enabler for data linkages. How far have countries systematically included national identification in their reporting forms?

(d) What types of country support could be facilitated by global CRVS partners to strengthen in-country multi-sectoral collaboration and data linkages on road traffic fatalities?

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<sup>13</sup> *The High Toll of Traffic Injuries: Unacceptable and Preventable*, World Bank, 2017.





## **XII. Acknowledgements**

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