Meta data

1. Introduction

Using data for policymaking or in scientific research requires sufficient knowledge about the quality of the data source. As the data is instrumental to the outcome of the process, unknown anomalies of the data will yield invalid conclusions. Therefore is it crucial to know the reliability of the data source.

Meta data describe this reliability. We distinguish several properties of the data and the data source that together define the reliability. These properties are described in chapter 2 in a conceptual way. Chapter 3 and 4 describe two applications of this structure of properties: Dutch crash data and Dutch data on distance travelled.

2. Conceptual description of meta data issues.

Scope

The scope of a data collection is the purpose of the registration process.

In traffic safety, we often use databases compiled with a completely different scope e.g. a hospital registration. However, these sources might contain valuable information about traffic accident related injuries or other issues concerning road safety.

Definitions

This put constraints on what is considered to be inside the scope of the data collection e.g. a traffic accident is an accident involving at least one vehicle and happens on a public road.

Intake policy

This defines the lower and upper threshold if applicable to incorporate cases in the database

Practice

The formal definitions and policies might not be completely observed. This can result in underreporting.

Accuracy

Values might be known with certain accuracy or can even be estimates.

Information that is more accurate might be available but the expenses to actually collect it can be too high.

Coding procedure

All information gathered will be coded to enable processing.

By design, this is reducing the data to the classifications allowed by the coding system.

The coding system might narrow down the level of detail or simply does not allow for coding all information available.

Validity

Knowing the constraints, one can establish the validity of the data collection in relationship to the questions one would like to answer.

Below an example of meta data for the road crash database in the Netherlands.

Road crash data

Country: The Netherlands

Source: Bestand geRegistreerde Ongevallen in Nederland, BRON

Scope

Registration of road crashes in the Netherlands.

Definitions

- A crash is considered a road crash when there is at least one vehicle involved, actively participating in traffic on a public road.
- Damage to parked vehicles is not considered a traffic crash.

Intake policy

In the Netherlands, the police register the accidents.

The massive motorization made the police decide not to register property damage only crashes with less than € 1000,- damage.

In 2011, there was a major policy change at the police. Only if there is a severe violation of the law, the crash will be registered. As a consequence the number of registered accidents dropped substantially.

Registration rate of killed victims

CBS obtains the data via the obligatory reporting system. In this system the doctor or autopsist sends the "cause of death"-form, together with the death-certificate to the Register of Births, Marriages, and Deaths of the municipality where the death occurred. The "cause of death"-form, which the doctor only fills in for the statistics, is then sent to Statistics Netherlands (CBS).Further, data of court records of unnatural deaths are also used to compare to BRON data. These three sources together form the basis of the actual number of road fatalities in The Netherlands.

The number of killed in BRON having the nationality of the Netherland can be compared with the CBS registration.
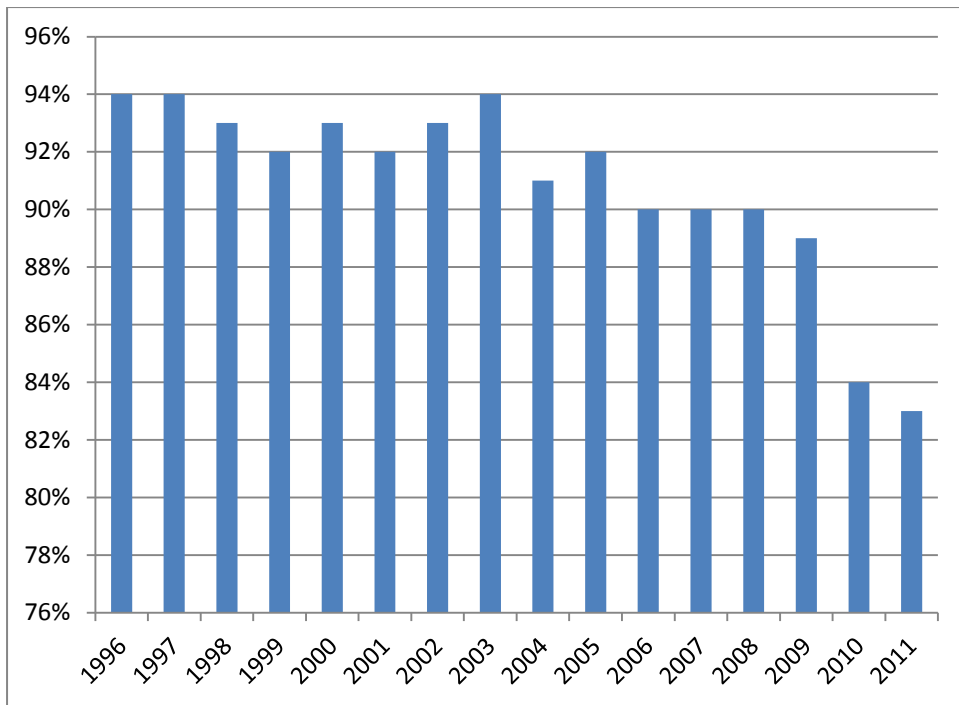
Figure 1: Registration rate of killed victims

Registration rate of severe injuries

The hospitals in the Netherland maintain a registration of the reason why somebody is admitted. One of these reasons can be a traffic crash. If BRON data are matched with hospital data, it turns out that many in-patients recorded in BRON are actually not inpatients, and vice versa. Also many inpatients turn out to be slightly injured. Since 2010, a minimum injury of MAIS2 is necessary for casualties to be counted as serious road injury. The number of actual serious road injuries in crashes with motorized vehicles, (recorded either as in-patient or as emergency room treatment) recorded in BRON, is decreasing as shown in figure 2.:
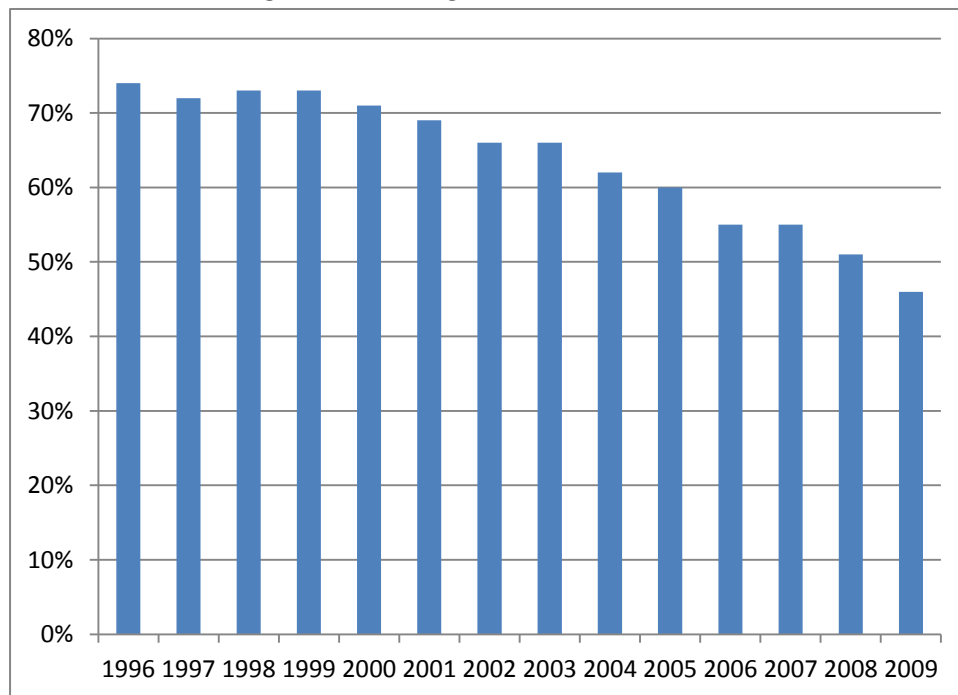

Figure 2: Registration rate severe injuries

Practice

While the intake policy puts constrains on the number of accidents to be registered, there are reasons why the actual number of crashes might be lower than the intake policy allows for.

First of all the police must be notified of an accident. This is not always the case e.g. single vehicle accidents involving damage to e.g. crash barriers are a known example.

Single accidents with bicyclist do comply with the definition of a traffic accident but everybody including the police considers it an 'accident' just like when a pedestrian falls.

This makes BRON almost useless as a source for single vehicle accidents involving bicyclist.

In general, the more severe the accidents, the better the registration rate.

Accuracy

Injuries

The injuries are coded using a simple scale:

1. Dead on the spot.

2. Dead within 30 days
3. In-patient
4. Emergency treatment
5. Slightly injured

All but the first requires the police to contact the hospital and to verify the severity of the injury.

In practice there is a substantial difference between the injury severity as reported by the police and the one derived from the hospital registration.

Speed limit
There are indications that the police have problems to differentiate between 30 km/h and 50 km/h speed limits.

A common error in case of mopeds is to record the speed limit of the moped (30 km/h inside buildup area, 40 km/h outside) instead of the limit of the road.

Coding procedure
The road crash database is maintained by the Ministry of Transport and Environment (I&M) and is based on the report forms filled in by the police and sent to I&M.

Data are registered since 1976. In 2004, there was a major change in the coding procedure.

Completeness
In case of missing or incomplete information, the coding office tried to get this information by calling the police. From 2004 on this is no longer the case.

Exception to this rule is severe crashes resulting in death or in-patient hospitalization

Location
Part of the registration form is a diagram of the road and the vehicles.

This allows for coding the maneuvers.

I&M decided to stop coding this from 2004 on. Therefore, it is no longer possible to derive information about the (intended) manoeuvers of the vehicles involved.

Conclusions
Over the years, the registration rate of fatal and severe accidents dropped substantially.

At the present BRON is considered by many not to be a valid source for reliable information about traffic safety in the Netherlands.

By comparing BRON with other resources, one can make an estimate of the real number of victims.

In case of severe injuries the registration rate has dropped to such an amount that the error margin of this comparison becomes too high.

BRON is not a valid source for single vehicle accidents.

Not all information as compiled by the police is available in the database. Noticeably information about the maneuvers is no longer coded

References

Road crash registration (BRON) – SWOV

Causes of Death - CBS

National Medical Registration (LMR) – Prismant

Serious road injuries in the years 2009 and 2010 M. Reurings & N. Bos. SWOV, Leidschendam