

Use of road safety knowledge by policy makers

Summary

Policy makers often fail to make use of existing scientific knowledge about road safety. Much research has already been done into why this knowledge is not used, or only in a limited way. In this fact sheet, we will first define the concept of 'knowledge use' and discuss the various types of knowledge use. We will then describe the various factors that influence knowledge use in the decision-making process - positively or negatively - such as the form and nature of the knowledge, the characteristics of the knowledge user, the nature of the road safety problem and the form of the decision-making process. Finally, recommendations are made for reconciling the 'different worlds' of researchers and policy makers.

Background

There is something of a hiatus between the production of scientific knowledge and the use that politicians and policy makers make of that knowledge. On the one hand, Dutch and Swedish research shows that the number of fatal casualties per year could be reduced by 65% in the Netherlands (Wegman, 2001) and even by 80% in Sweden and Norway (Elvik, 2003) by using the cost-effective measures that have already been researched. On the other hand, policy makers and politicians often have good reasons to allow their policies to be guided by factors other than objective scientific knowledge alone. They balance this knowledge against all kinds of other interests for which they have been given responsibility.

This fact sheet gives a theoretical justification for the difference between science and practice, shows the factors that influence the use of scientific knowledge by policy makers and makes a recommendation for bringing science and practice closer together.

What do we understand by 'knowledge' and 'knowledge use'?

How can we define the terms 'knowledge' and 'knowledge use'? In foreign literature, the word 'knowledge' is often not defined. Edelenbos (2000) distinguishes the following forms of knowledge:

- data: separate, unordered items of data;
- information: data ordered in a meaningful way;
- knowledge: information present in a person or organization;
- wisdom: a combination of knowledge, experience and intuition.

More has been said about the definition of 'knowledge use'. In the literature on the subject, knowledge use is regarded both as an outcome and as a process (Rich, 1997). In the latter case, the main thing is that knowledge has a function in the policy formation process, and that the outcome of the policy formation process is not relevant to the definition of 'use'. In the former case, the main thing is the actual influence of knowledge on the outcome of the policy formation process.

What types of knowledge use are there?

Different researchers in the Netherlands and other countries distinguish different types of knowledge use in the decision-making process. Knott & Wildavsky (1980) distinguish a vertical scale of seven ways in which knowledge can be utilized (see *Figure 1*), both as a process and as an outcome. Policy makers may simply receive knowledge (*reception*: for example, a report that lands on their desk) or they may also read and understand it (*cognition*). Knowledge can also influence the way in which the policy maker regards reality (*reference*). When the knowledge influences the behaviour of a policy maker, we speak of *effort*. Knott & Wildavsky refer to the influence of knowledge on the policy outcomes as *adoption*. Finally, we speak of *implementation* if the policy that has been influenced is also actually carried out, and of *impact* when the implemented policy produces the desired effects.

| | |
|------------------------------------|----------------|
| Receipt of information | Reception |
| Reading and understanding | Cognition |
| Influence on conception of reality | Reference |
| Influence on behaviour | Effort |
| Influence on policy outcome | Adoption |
| Influence on implemented policy | Implementation |
| Influence on desired effects | Impact |

↓

Figure 1. *Seven ways in which knowledge can be utilized in the policy process (Knott & Wildavsky, 1980).*

Hoppe (2003) gives another categorization. He distinguishes between the functions of knowledge use and hence arrives at three different forms of use of scientific knowledge: as a provider of data, of ideas and of ammunition. As a data provider, science supplies routine research data that the policy makers use when making concrete, frequently small-scale decisions. This type of knowledge use mainly takes place in order to justify plans that policy makers have already made. One example from road safety is the use of accident data by local governments when they make decisions on road safety measures. In addition, science can apply its knowledge in order to function as a provider of ideas. In this way, knowledge can influence the policy agenda and throw light on unresolved policy problems. An example of this was the launch of the Sustainable Safety vision, whereby solutions to the road safety problem were offered in the form of an integrated package of measures. Finally, science can function as a supplier of ammunition in the policy process: policy makers, politicians and others use scientific research to legitimize their own standpoints and persuade others to share their standpoint. An example of this is the decision making on road safety measures in the draft National Traffic and Transport Plan, in which selective use was sometimes made of information that fitted in with the existing policy plans (Bax, 2001).

What road safety knowledge do policy makers utilize?

Weiss (1980) and others have carried out extensive research into knowledge use in decision making processes (not specifically for road safety). From this, they draw a disappointing conclusion: research is seldom used directly. In the most favourable case, research influences the ideas of policy makers, after which the new ideas sooner or later contribute to policy.

Only sporadic research has been conducted into the use of (scientific) road safety knowledge by policy makers. Bax (incl. 2006) studied the use of road safety knowledge in decision making with reference to the National Traffic and Transport Plan (NVVP) that was drawn up from 1997 to 2002. She concluded that policy makers primarily use knowledge if it fits in with an existing policy line, if they have requested the information themselves and if the knowledge is relatively new. She also studied knowledge use in municipal networks (Bax et al., 2008). In that study, she did not examine the use of scientific information; instead, she examined the use of experiential information and specific information about the local situation. The study examined whether municipalities gathered information from neighbouring municipalities, emergency services, public transport companies, farmers and citizens when creating 60 km/h zones. The study showed that few municipalities were interested in exchanging knowledge with neighbouring municipalities, emergency services and public transport companies. Municipalities assumed that consultation with others would produce little additional information. Conversely, emergency services and public transport companies in particular found it important to share with municipalities their specific knowledge about the consequences of road safety

measures for their journey and arrival times and convenience. Although citizens and farmers were often involved in the decision making only at a later stage, municipalities found their knowledge valuable and often used it in their policies.

Finally, specific research has also been carried out into the use of knowledge about the costs and effects of road safety measures. Information about this can be found in the SWOV fact sheet [Use of information on costs and effects](#).

What influences knowledge use?

The dominant theory about knowledge use by policy makers was developed by Caplan (1979). He examined why policy makers often do not utilize knowledge and sees the reason in the cultural difference between the policy-making and scientific communities. This vision is known as the 'Two Communities' metaphor. There are substantial differences in the language, interests and reward systems of these two communities. Caplan has found empirical support for this in his study: there would seldom be contact between scientists and policy makers. He also puts forward empirical reasons for the hypothesis that this gap is responsible for failure to use scientific knowledge in decision-making processes.

The 'Two Communities' metaphor has inspired researchers to look for other specific factors that determine the failure to use existing scientific knowledge. Since 1980, many studies have been carried out and discovered factors that influence knowledge use in decision-making processes. It is remarkable that the cited factors are extremely diverse. Landry et al. have written a good article providing an overview of this issue (see also Bax, 2007; Landry et al., 2001). In broad terms, the factors can be divided into four groups:

- form and nature of the knowledge;
- context of the user;
- nature of the problem;
- form of the decision-making process.

These factors influence not only the amount of knowledge that is used, but also the way in which it is used, e.g. as a provider of data, as a provider of ideas and as a provider of ammunition. It is clear how the first two factor groups (form and nature of the knowledge and context of the user) promote knowledge use. As for the latter two groups (nature of the problem and form of the decision-making process), the literature does show that these factors change knowledge use, but not whether the use increases or decreases. We will discuss these four groups of factors in more detail below.

What is the influence of the form and nature of the knowledge?

The first group of factors that influences knowledge use relates to the form and nature of the knowledge itself. These factors have been studied most. The factors that promote knowledge use are:

- readable presentation of the study (it is clear that factors such as whether the study is presented verbally or in writing and whether it is presented in abstract or concrete terms have an effect on knowledge use, but the precise effect is unclear);
- whether the knowledge can be used and implemented (specific and applicable conclusions);
- quality of the research (methodological reliability).

What is the influence of the user's context?

This concerns the characteristics of the user of the knowledge and his attitude to the research. The user's relationship with the researchers is also important. Factors that promote knowledge use are:

- the user's vision of the decision-making process; this must fit in with that of the knowledge producer (analytically or politically);
- extent to which the research corresponds to the user's needs;
- extent to which the research corresponds to the user's opinion;
- the correct moment for the study to appear;
- (informal) contacts with researchers;
- good reputation of the researchers in the user's estimation;
- engagement of external evaluators to evaluate the knowledge, thereby increasing its reliability.

What is the influence of the nature of the problem?

Knowledge use also depends on the type of problem which policy makers are confronted with. Information has to be relevant to this. With structured problems, knowledge is utilized in a routine way;

with badly structured problems, knowledge can be used as part of the political game. Three factors determine the type of problem and thereby the use of knowledge:

- clarity concerning the aim of the solution to the problem (e.g. is it a routine problem?);
- how many actors are involved in the decision making (complex environment)?;
- political consensus regarding the problem.

The literature shows that these factors have an influence on knowledge use, but it does not show whether this influence is positive or negative.

What is the influence of the form of the decision-making process?

Finally, there are some characteristics of the decision-making process that can influence knowledge use. These partly overlap with the characteristics cited under 'nature of the problem'; different types of problem lead to different (appropriate) types of decision-making processes. The most important factors that can affect knowledge use are:

- centrality of the decision making;
- number of actors involved in the decision making;
- political sensitivity of the decision making / presence of conflict;
- efforts to distribute knowledge during the decision-making process: the way in which knowledge is distributed among the participants in the decision-making process and the amount of time that is devoted to this purpose;
- engagement of intermediaries to distribute knowledge during the decision-making process.

Once again, the literature shows that knowledge use varies as a result of these factors, but not whether it increases or decreases.

What knowledge about road safety is used in other policy spheres?

It seems to go without saying that road safety knowledge is taken into consideration in policy on that subject. To an increasing extent, however, road safety is not organized on a sectoral basis; instead, it has become a facet of other policies. Due to the decentralization of road safety policy and the decompartmentalization of financing at provincial level, road safety is increasingly seen as an element of traffic and transport policy (see Chapter 15 in Wegman & Aarts, 2005). Furthermore, policy makers attempt to integrate road safety in plans for mobility (e.g. in the regional network analyses), spatial planning (e.g. urban building) and the environment (e.g. 'Het Nieuwe Rijden' (*Ecodriving*); see also the Strategic Road Safety Plan 2008-2020) (Doumen, Schoon & Aarts, 2010). Road safety knowledge thereby becomes important for these policy areas as well.

Naturally, the aforementioned factors affect knowledge use in these cases too. A prime condition for the use of road safety knowledge, however, is that policy makers in the fields concerned are aware of the effect they have on road safety and vice versa. Only if this awareness exists can they also be open to road safety knowledge. The reason that this is not spontaneous and frequently takes up a lot of time appears to lie in the relationship between road safety and spatial planning. These two fields remained separate for a long time, but are now moving closer together.

Conclusions

From the above information one can draw the conclusion that scientific knowledge is utilized to a limited extent in decision-making processes. An important reason for this is probably to be found in the different worlds of knowledge producers (scientists) and knowledge users (policy makers).

Based on the studies presented above, we can make the following recommendations.

Knowledge providers and knowledge users should remember to communicate clearly with each other about expectations, desires, possibilities and limitations of research. Topics for discussion between knowledge producers and knowledge users could include:

- the question that the research is supposed to answer;
- the way in which the results will be used and the appropriate forms of presentation;
- the deadline for availability of results and the consequences for decision making of any delay;
- agreements on a form of quality control, especially if the principal cannot easily check the results for itself. In such cases one might, for example, call in an external expert or committee;
- the way in which the principal remains involved in the progress of an ongoing study so that course adjustments can be made if necessary.

Sources and publications

- Bax, C.A. (2001). [Besluitvorming over veiligheid in het Nationaal Verkeers- en Vervoersplan; Fase 2 Verkeersveiligheid in de Perspectievennota en het beleidsvoornemen](#). D-2001-21. SWOV, Leidschendam.
- Bax, C.A. (2006). [Besluitvorming over verkeersveiligheid in het Nationaal Verkeers- en Vervoersplan. De inspraakfase, het kabinetsstandpunt en de behandeling in de Tweede Kamer](#). D-2006-4. SWOV, Leidschendam.
- Bax, C.A. (2007). [Gebruik van informatie bij investeringen in infrastructuur. Literatuurstudie en onderzoeksopzet](#). R-2006-8. SWOV, Leidschendam.
- Bax, C.A., Litjens, B.P.E.A., Jagtman, H.M. & Pröpper, I.M.A.M. (2008). [Samenwerken bij het aanleggen van 60km/uur-gebieden. Eindrapport](#). R-2008-7. SWOV, Leidschendam.
- Caplan, N. (1979). [The Two communities theory and knowledge use](#). In: American Behavioural Scientist, vol. 22, nr. 3, p. 459-470.
- Doumen, M.J.A. Schoon, C.C. & Aarts, L.T. [Integraal beleid voor verkeersveiligheid: wat houdt dat eigenlijk in? : een studie naar integraal sectorbeleid en integraal facetbeleid](#). R-2010-11. SWOV, Leidschendam,
- Edelenbos, J. (2000). *Proces in vorm*. Lemma, Utrecht.
- Elvik, R. (2003). [How would setting policy priorities according to cost-benefit analyses affect the provision of road safety?](#) In: Accident Analysis & Prevention, vol. 35, nr. 4, p. 557-570.
- Hoppe, R. (2003). *Werken op de grens tussen wetenschap en politiek: naar een typologie van grensarrangementen*. In: Beleidswetenschap, nr. 2, p. 144-170.
- Knott, J. & Wildavsky, A. (1980). [If dissemination is the solution, what is the problem?](#) In: Knowledge; Creation, Diffusion, Use, vol. 1, nr. 4, p. 537-578.
- Landry, R., Amara, N. & Lamari, M. (2001). *Use of social science research knowledge in Canada*. In: Research Policy, vol. 30, nr. 2, p. 333-349.
- Rich, R.F. (1997). *Measuring knowledge use: processes and outcomes*. In: Knowledge and Policy, vol. 10, nr. 3, p. 11-24.
- Wegman, F.C.M. (2001). [Veilig, wat heet veilig? SWOV-visie op een nóg veiliger wegverkeer](#). R-2001-28. SWOV, Leidschendam.
- Wegman, F.C.M. & Aarts, L. (eds.) (2005). [Advancing sustainable safety; National Road Safety Outlook for 2005-2020](#). SWOV, Leidschendam.
- Weiss, C.H. (1980). *Knowledge creep and decision accretion*. In: Knowledge: Creation, Diffusion, Use, vol. 1, nr. 3, p. 381-404.