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Swedish Vision Zero policies for safety – A comparative policy content analysis

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ABSTRACT

The Vision Zero policy was adopted by the Swedish parliament in 1997 as a new direction for road traffic safety. The aim of the policy is that no one should be killed or seriously injured due to traffic accidents and that the design of the road transport system should be adapted to those requirements. Vision Zero has been described as a policy innovation with a focus on the tolerance of the human body to kinetic energy and that the responsibility for road safety falls on the system designers. In Sweden, the Vision Zero terminology has spread to other safety-related areas, such as fire safety, patient safety, workplace safety and suicide. The purpose of this article is to analyze, through a comparative content analysis, each Vision Zero policy by identifying the policy decision, policy problem, policy goal, and policy measures. How a policy is designed and formulated has a direct effect on implementation and outcome. The similarities and differences between the policies give an indication of the transfer method in each case. The results show that the Vision Zero policies following the Vision Zero for road traffic contain more than merely a similar terminology, but also that the ideas incorporated in Vision Zero are not grounded within each policy area as one would expect. The study shows that it is easier to imitate formulations in a seemingly successful policy and harder to transform Vision Zero into a workable tool in each policy area.

1. Introduction

Vision Zero was adopted by the Swedish parliament in 1997 as a new direction for road traffic safety (Swedish Parliament, 1997a, 1997/98:TU4). According to the decision, the long-term goal of road traffic safety is that no one should be killed or seriously injured as a result of traffic accidents in the road transport system and that the design and function of that system should be adapted to the requirements of Vision Zero (Swedish Parliament, 1997b, 1997/98:13). Vision Zero has been described as a policy innovation within road traffic safety as it differs from traditional traffic policies with regard to a problem formulation based on scientific principles regarding injuries, its view on responsibility, its requirements for the safety of road users, and the ultimate objective of road safety work (Belin et al., 2012).

Vision Zero is internationally seen as a promising road traffic safety policy (International Transport Forum/OECD, 2016; Kim et al., 2017). This impression has been strengthened by official statistics in Sweden showing that the number of road deaths was halved and that the number of deaths among car users decreased by 60% during 2000–2010. While the decrease has stagnated somewhat after 2010 (Swedish Transport Administration, 2016), Sweden's roads are still among the world's safest, with only 3 of every 100 000 Swedes dying on the roads each year, compared to 10 in the USA (OECD, 2016). The positive development of road deaths has been seen by many as proof of the policy's effectiveness. It should be noted though, that few studies show a direct cause-and-effect between the Vision Zero policy as a whole and the positive development, but there are studies indicating such a connection (c.f Strandroth, 2015).

Vision Zero policies for road traffic safety have been introduced in other countries, such as Norway, Denmark, and the USA. In Sweden, the Vision Zero terminology has spread to other safety-related areas, such as fire safety, patient safety, workplace safety and suicide. Furthermore, similar policies have been proposed in a number of other policy areas, including pollution at sea, homelessness, drowning prevention, eviction

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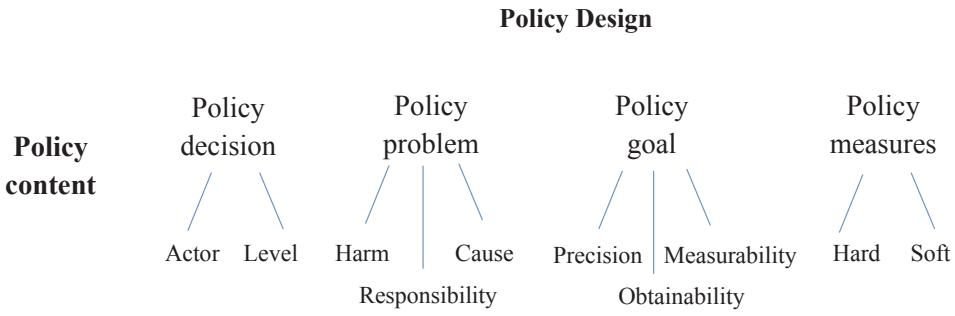

Fig. 1. A policy content analysis framework.

of families with children, violence against women, and drug use in schools to name but a few areas. It is also important to acknowledge that the concept has also inspired technological innovations in for instance the car industry, where several brands are working towards zero crashes. This cross-sectoral diffusion of Vision Zero raises a number of questions such as whether we are merely witnessing diffusion of a "buzzword" or if the policies are built on similar approaches to problem and goal formulation as well as measures to achieve this goal. While diffusion of policy innovations has been described by many scholars (c.f. Rogers, 2003), this research has predominantly had a processual approach, i.e. emphasizing *how* policies are diffused and transferred while focusing less on *what* is transferred, i.e. transfer content (Knill, 2005). Central to this article, transfer content is a key aspect in understanding the nature of the transferred policy and whether an actual diffusion has taken place at all.

Research on Vision Zero policy is relatively limited (Zweetsloot et al., 2013) and has focused on road traffic safety, with scant attention paid to cross-sectoral or comparative aspects. This study provides a cross-sectoral policy content analysis in order to identify similarities and differences between Vision Zero policies in five safety areas: road traffic safety, fire safety, suicide, patient safety, and workplace safety. All of them nationally adopted in Sweden for the common purpose of preventing fatal and serious injuries. The purpose of this article is twofold: to describe the actual content of each Vision Zero in terms of the formal policy formulation in policy documents and to analyze and discuss policy content variation. The article contributes to the research on Vision Zero from a broad safety science perspective and adds to the knowledge on cross-sectoral policy transfer.

2. Vision Zero in safety research

The concept of Vision Zero engages a growing number of scholars, but research has mainly been restricted to issues concerning the applicability of Vision Zero. There are exceptions, such as an in-depth study by Belin et al. (2012) providing a deconstruction of the policy, and a comprehensive description in an article by Kim et al. (2017). These studies show that the Vision Zero policy design is connected to the shift within safety research from a view of accidents as the main problem to kinetic energy and the tolerance of the human body as the real cause of deaths and serious injuries, as proposed by de Haven (1942/2000), Haddon (1968, 1970, 1972, 1973, 1980), and Robertson (1983). Another key component is the shift from individual responsibility to the importance of system design (Reason, 2000), as well as an acceptance of accidents and minor injuries occurring, but not deaths and serious injuries. The advantages of this "system's approach" have been highlighted by several researchers (c.f. Larsson et al., 2010; Salmon et al., 2012). The philosophical and psychological aspects of Vision Zero have also been studied in relation to suffering (Dekker et al., 2016), and human behavior and mistakes (Šucha, 2014).

A few Vision Zero studies have focused on key components, such as problem formulation and design principles (Johansson, 2009), concluding that the introduction of Vision Zero entails a change in traditions and road traffic culture, as well as new ethical and moral principles (Elvebakk, 2007), leading to trade-offs, differences and conflict of interests (Belin and Tillgren, 2012) within the policy area. Vision Zero has been criticized for presenting an unobtainable, unrealistic, rhetorical, and irrational goal (Elvik, 1999; Lind and Schmidt, 1999), for undermining the individual responsibility and freedom (Ekelund, 1999), and for not being cost-efficient (Elvik, 2003). Such criticisms have been met with arguments that the policy provides a rational response to an urgent problem (Rosencrantz et al., 2007) and that the focus on system design provides a complement to, rather than replacing, the responsibility of the individual (Nihlén Fahlquist, 2006).

3. A framework for comparing public policy content and variation

In order to identify the 'transfer content' (Knill, 2005) of the five Vision Zero policies, a framework based on a definition drawn from public policy literature (c.f. Hall, 1993; Birkland, 2010; Cairney, 2012; Knill and Tosun, 2012) is used. The framework contains the basic components of a public policy, i.e. the policy design, here identified as policy decision, policy problem, policy goal, and policy measures (see Fig. 1).

Knowing more about how a policy is designed is crucial as the actual policy formulation effects policy implementation and outcomes. The design is based on the ideas and motives of public authorities and other influential actors, sometimes referred to as program philosophy (Conrad and Miller, 1987), traditionally studied by using program theory (c.f. Bickman, 1987; Rose, 1991). A policy is often based on ethical or utilitarian aspects often derived from best practice and innovative policies and Vision Zero is apparently seen as such.

A public policy is thereafter formulated in a *public decision-making* procedure. The term public indicates that the policy is initiated by, or at least in cooperation with, public authorities, whether it is on local, regional or national level or executive, legislative, judicial or bureaucratic. Key factors here are decision-making actor and level. Second, a public policy is based on a demand and a formulation of a specific societal *problem*. The problem formulation is based on some sort of societal harm, what causes it, and who is responsible for the problem and its solution (Stone, 1999; Knill and Tosun, 2012). What problem ends up on the agenda is part of a construction process and often related to power (Bacchi, 1999). Third, a policy contains a definition of purpose and sets a *goal*. The formulation of goals can be analyzed by using concepts from policy implementation, policy decision-making, and policy evaluation theories (c.f. Elmore, 1978/1997; Peters, 2015). A goal can be studied based on its clarity and precision, if it is measurable, reasonable, and realistically obtainable, in terms of distribution of tasks and resources. Finally, a public policy is related to action and policy instruments, meaning the establishment of strategies and a set of specific *measures*. These measures are here separated into two larger categories; first, 'hard' or direct measures meaning more directive and authoritative instruments, such as laws, inquiries, national strategies, reforms, and second, 'soft' or indirect measures meaning economic subsidies and information instruments, such as providing resources and launching information campaigns (Howlett, 2011; Knill and Tosun, 2012; Peters, 2015).

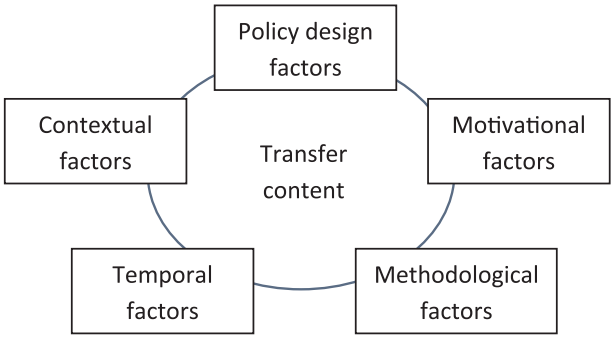

Fig. 2. Understanding transfer content variation.

After having identified the specific policy design of each of the five cases, the ambition of this article is also to discuss the variation in the policy content. What tools can help us to understand what happens when an existing policy is implemented in other policy areas? Policy transfer is a complex process *within* the same sector. An increased level of complexity is expected when policies transfer *between* sectors. Drawing from existing literature on policy transfer and comparative policy research (Rose, 1991; Stone, 1999; Shipan and Volden, 2008; Knill and Tosun, 2012), a number of aspects explaining variation can be identified, such as time, institutions, culture, socio-economics, policy design, state structure. These aspects can be sorted into five overarching categories: motivational, contextual, methodological, policy design, and temporal factors (see Fig. 2).

The *motivational factors* can be related to cost-effectiveness, subsidies, and marketing values, as well as coercive measures or gains (c.f. Shipan and Volden, 2008). Other motives for adopting an entire policy package is the success of the original policy with few known negative effects, and that there is plenty of information about the policy (Rose, 1991). *Contextual factors* are ideological setting within the policy area (Dolowitz et al., 1999), institutional, judicial and bureaucratic preconditions (Rose, 1991), influential actors, economic resources, internal discussions, sense of urgency, and the systemic structure. Learning and imitation (Shipan and Volden, 2008) are two *methodological factors* explaining policy variation. *Policy design factors* such as where the original policy is built on a straightforward problem, where there is one clear-cut goal instead of several, and where there is a direct link between problem and goal, can alleviate the adoption of a whole policy (Rose, 1991). *Temporal factors* matters such as the timeliness of a certain idea, sometimes referred to as 'policy windows' (Kingdon, 1984) and if similar policies are adopted during different time periods. The two frameworks will help us to understand not only what policy is being transferred, but also why the design of policy remains similar or differs.

4. Method and material

The study is based on text analysis and the Vision Zero policies have been traced in various types of policy documents. The material constitutes the formal texts introducing the official policy formulations, such as government bills, parliament decisions, national guidelines and strategies from public authorities, public inquiries, and public authority documents from the policy areas in question. The documents have been selected in order to trace the public decision-making of each Vision Zero by using a snowballing method. The texts have been thoroughly read several times and the policy content framework has been used to sort the material.

There is a vivid discussion within each policy area about the pros and cons of Vision Zero. This debate has not been included here as it would require another framing of the article. We are aware of the temporal differences between the cases and the ambition is to create a snapshot of the formulation of each Vision Zero. Even though a policy may change from formulation to outcome, these policy documents state the basic motives and ideas embedded in the policy and this initial phase often steers a policy in a certain direction not likely to change quickly (c.f. Bacchi, 1999).

The choice to make a comparative policy analysis is based on a desire to understand how each area addresses the concept of Vision Zero. The material reveals opportunities and challenges concerning cross-sectoral policy transfer. The cases have been selected based on three main criteria; first, they are based in the same country, political context, and are nationally adopted, second, they are related to the area of personal safety with the similar goal to decrease fatal and serious injuries, and third, these policy areas are generally grounded in the same theoretical framework and principles concerning safety science (Andersson and Nilsen, 2015). Another interesting factor in the selection of the cases is the differences in the timing of the adoption of Vision Zero, which may reveal interesting variations and similarities.

Case studies can in general provide vital knowledge about specific areas and in this study about each Vision Zero policy context. Case studies can lead to more in-depth knowledge, particularly about complex societal problems where many actors are involved (Yin, 2003), such as in all our cases. The case studies provide deeper insights into motives, resources, support, and temporal aspects. Comparing the policy content of each case will enhance the knowledge on what is being transferred between different policy areas and allows for a discussion on both variations and similarities.

5. Results

5.1. Case 1 – Vision Zero for road traffic safety

5.1.1. Policy decision

The parliamentary decision from 1997 on a Vision Zero for road traffic safety was based on years of discussion and in 2004, the Swedish government reiterated its commitment to Vision Zero (Swedish Government, 2004). Since then, Vision Zero has been in and out of government focus and in 2016, led by the Social Democratic Party and the Green party, the government decided to "restart" the Vision Zero policy program. The main responsibility for the implementation and development of Vision Zero rests on the Swedish Transport Administration. Other important actors are the Swedish Transport Agency, transport organizations, the car industry, and similar.

5.1.2. Policy problem

In a traditional road traffic safety policy, accidents are viewed as the problem to be solved. Various accident commissions of inquiry over the years have concluded that the road user is the cause of over 90% of all road accidents (Evans, 2004). In Vision Zero, instead of accidents, the problem to be solved are the deaths and serious injuries, seen as a result of the kinetic energy to which road users have been exposed and the tolerance of human beings to external violence. From that perspective there are studies showing that deficiencies in the road traffic environment and vehicle system are the main cause of approximately 63% of all deaths (Stigson et al., 2008). The chosen approach to road traffic safety policy naturally leads to a preferred set of statistics, a case of what you look for is what you find (Lindberg et al., 2009). But in the case of Vision Zero, the traditional approach is regarded as problematic in relation to reaching the long-term goal of zero deaths and serious injuries, mainly because it is seen as departing from an unsolvable problem – the imperfect human being.

The focus on the road user in traditional traffic safety policy also entailed a strong emphasis on the legal liability of road users for safety matters (Friedland et al., 1990). Training, information, regulation, and monitoring directed at the individual and a strong lack of trust in the road user's ability and willingness to behave correctly, have been key features of traditional policy (Evans, 2004). The role of the traffic user has thus shifted from being a subject of control by Government

authorities to being an agent that makes demands on system design. The question of the role of the road user raises issues similar to those considered in research in other safety-related areas (Kohn et al., 2000; Reason, 2000). Therefore, there is a need for system designers to take the ultimate responsibility for the design, up-keep and use of the road transport system, and in that way be responsible for the safety level of the entire system. As before, road users are responsible for showing consideration, for having a sense of judgment and responsibility in traffic, and for complying with traffic regulations. And if road users do not shoulder their share of the responsibility – owing, for example, to a lack of knowledge, acceptance or ability – the system designers must take further measures to combat the occurrence of deaths or serious injuries. Ultimately, the Government anticipated the taking on of a series of responsibilities by system designers and road users, which both began and ended with the designers.

5.1.3. Policy goals

Traditionally there has been an assumption that there is a limit to safety, i.e. there is an optimal level of deaths and serious injuries, defined by the point at which the costs of intervention exceed the benefits (Elvik, 1999). Vision Zero has a different perspective, emphasizing the total elimination of deaths and serious injuries, at least in the long term. The Vision Zero states that "… no one shall be killed or seriously injured due to road traffic accidents within the road transport system." (Swedish Government Bill, 1996/97:137, our translation) and the policy aims at reducing risks in stages. In 2009, the Swedish parliament decided upon an interim goal meaning that the number of killed should be cut in half and the number of seriously wounded to decrease by ¼ from 2007 to 2020 (Swedish Transport Administration, 2016; Swedish Parliament, 2015; Swedish Government, 1997). There is currently a work in progress concerning establishing the goals towards 2030 and 2050 (c.f. Swedish Transport Administration, 2016).

5.1.4. Policy measures

The scientific foundation of Vision Zero shows that a different road and vehicle design, which improves the tolerance of human beings to external violence, would mean that up to 63% of all deaths could be avoided. For example, it was common practice to solve safety problems at four-way intersections by using traffic lights. This type of measure admittedly reduces accidents and injuries in general (Elvik and Vaa, 2004), but the accidents that still occur will be the more serious as a consequence of the high speed involved. A roundabout, on the other hand, increases the likelihood of accidents, but reduces the risk of serious accidents as a consequence of the lower speed (Elvik and Vaa, 2004). Therefore, roundabouts are preferable from a Vision Zero perspective. Vision Zero emphasizes the importance of road and infrastructure design, vehicle technology, and various forms of enforcement. A number of concrete measures and projects was initiated after the establishment of Vision Zero such as management and governing measures, 2 speed limits, quality of transports, coordination activities, The question is whether the design of Vision Zero, from problem assessment to policy measures, is the key to the success within road traffic safety or is it simply is a matter of having a comprehensive program.

5.2. Case 2 – Vision Zero for fire safety

5.2.1. Policy decision

In 2010, the Swedish Civil Contingencies agency presented a new strategy for the strengthening of fire safety, with a particular focus on support for individuals (Swedish Civil Contingencies agency (MSB), 2010). The production of a strategy was based a government assignment and contains a Vision Zero. National strategies had been discussed for a long time and the political visions were first presented in a Government Bill in 2002 (Swedish Government, 2002), which led to the Swedish Law on accident prevention (2003:778). The discussion was inspired by efforts in other policy areas, such as workplace safety, road traffic safety, as well as fire safety measures and visions adopted in other countries.

The Swedish Civil Contingencies agency has the main responsibility to evaluate the national strategy, but it is stated that several actors need to be involved in implementing the vision. The agency has put together a national cooperation team from various sectors and levels with the aim to make progress through a broad, multi-faceted, and long-term preventive work. The national strategy entails cooperation between national, regional, local, and domestic levels.

5.2.2. Policy problem

The main function of the law from 2003 was to prevent and manage fires and accidents. The law was supposed to be implemented with respect to local preconditions and in cooperation with various actors. A government assessment from 2009 concluded that progress was slow as the number of fatalities each year was not decreasing. Therefore, the strategy from 2010 was an attempt to coordinate efforts within the field, with a focus on individuals with particular needs. The main problem described in the document is that around 100 individuals die each year due to fire and at least 1000 individuals are injured. A majority of the fatal fires take place in dwelling units due to smoking, arson, or stove-related fires. There is often no smoke detector in place or in function. There are high-risk groups in the society, such as individuals over 80 and those using alcohol in connection with the time of the fire. Various documents show that the number of interventions from the Fire department have been constant for a long time, but as the population over 80 grows bigger in a relative sense, the problem is predicted to rise. Social status, culture, and knowledge are also mentioned as important aspects when framing the actual and potential problem.

The responsibility for fires are mainly placed on individuals; "…the person [in a judicial sense], i.e. individuals and businesses, have a basic responsibility to protect life and property and to take the necessary precautions. The individual has a primary responsibility to protect his or her life and property in order not to cause accidents. […] It is only when the individual cannot herself or himself or with the help of others, cope with a situation in which public authorities have a responsibility to intervene." (Swedish Civil Contingencies agency, 2010:13, our translation). Even though the national strategy points to individual responsibility, there is also an awareness of human errors and the system's approach, particularly concerning "forgiving environments" (Swedish Civil Contingencies agency, 2010:32).

5.2.3. Policy goals

The Vision Zero for fire safety states that "No one shall die or be seriously injured due to fire" (Swedish Civil Contingencies agency, 2010:5, our translation) and it will be achieved through interim goals. The national strategy calls for separate goals for certain periods of time and that each period should be thoroughly evaluated in order to make adjustments to the following goal. The first goal set up by the strategy is to reduce the number of casualties and injuries due to fire in domestic dwellings by a third, by the year 2020. The period of comparison is 2008–2010. Another goal is to scrutinize the three existing databases on fire-related deaths in terms of quality, as statistical errors have been detected.

The interim goals are complemented by effect goals regarding level of security. One goal is to raise the awareness among individuals on how to act in case of fire and the other is to increase the number of smoke detectors in dwelling units.

5.2.4. Policy measures

The measures stated in the national strategies for achieving these goals are divided into four categories. The first concerns ***knowledge and communication***. Individuals and particularly those in risk groups are targets in a national campaign to increase knowledge about fires, what causes them and how to act. The national strategy points to the

importance of media and schools, as well as targeting particular groups such as immigrants and certain professions. The second set of measures concern ***technical solutions,*** such as smoke detectors, sprinklers, "forgiving" innovations, and systems such as self-extinguishing cigarettes. These devices are particularly important in dwelling units for older individuals. The third category is ***local coordination and cooperation*** and related to the responsibility of local fire authorities as well as local regulations. The national strategy identifies a need for local authorities to ascertain what individuals are at risk in the domestic environment, to determine the role and responsibility of property owners, and to pay particular attention to accidents related to fireplaces. The fourth area is ***evaluation and research,*** where the national strategies conclude that earlier evaluation and research efforts have been too wide. The suggestion is to focus more on vulnerable groups and environments as well as multi-disciplinary efforts.

5.3. Case 3 – Vision Zero for suicide

5.3.1. Policy decision

In 2005, the Swedish parliament decided to delegate to the Public Health Agency of Sweden and the National Board of Health and Welfare to produce a national strategy for suicide prevention. The agencies presented a suggestion for a national program in 2006, but argued for a national strategy instead of a Vision Zero policy. The government presented a bill for a renewed health policy in 2008 which was accepted by the parliament and the document presents a Vision Zero (Swedish Government, 2007). There was no consensus regarding the use of a Vision Zero as the investigating institutions argued that a more specific effect goal would suit the policy area better. Their suggestion was an overall goal to reduce the number of suicides. The government nonetheless decided to recommend a Vision Zero. The Public Health Agency of Sweden and the National Board of Health and Welfare are key actors in implementing the vision, in gathering and spreading information on suicide, as well as setting up preventing measures. Since 2008, there has been a vivid discussion within this policy area both criticizing and supporting Vision Zero (c.f. Holm and Sahlin, 2009).

5.3.2. Policy problem

The main problem described in the documents is that too many individuals, around 1500 people, commit suicide each year in Sweden. This is regarded as unacceptable and described as "…an individual tragedy and loss for the society. Suicide can have vast and long-term consequences for families and others close to the deceased, both emotionally and practically." (National Centre for Suicide Research and Prevention of Mental Ill-Health, 2006, our translation). According to the government bill (Swedish Government, 2007), the focus has for too long been on the individual. The Vision Zero adds a system's approach based on preventive measures and where the total environment surrounding each individual is targeted.

As an individual is connected to many situations throughout his or her life, it is difficult to pinpoint why and where a suicide is being committed. For many individuals it is related to psychological illness rarely medically treated or not sufficiently treated. For others, it can be related to bullying during childhood or as adults, domestic violence, or stress. Traumatic events or being pushed into committing suicide by others are other factors. In the identification of what causes suicide, the individual has traditionally been in focus and not broad national strategies. The Vision Zero for this policy area is based on a system's approach and several documents are inspired by Vision Zero for road traffic.

5.3.3. Policy goals

The Vision Zero for suicide states that "No one should find him- or herself in such an exposed situation that the only perceivable way out is suicide. The government's vision is that no one should have to end their life." (Swedish Government, 2007, our translation). The Vision Zero is based on the assumption that no human being should have to be in a situation where suicide is seen as the only solution. The bill does not reveal any interim goals but the national strategy contains a number of areas where preventive measures should be implemented. These is a mix of both measures and goals.

5.3.4. Policy measures

The national strategy and the government proposition identify a need to improve the preventive measures and focuses on effect goals and strategies within nine different areas; 1. Production of information material focusing on suicide prevention, particularly among school pupils, 2. Intensification of efforts to reduce alcohol consumption, 3. Continuation of measures on national, regional, and municipal level to reduce access to lethal means, 4. Initiation of a national function for knowledge assessment and event analysis, 5. Continuation of preventive work within the healthcare system, 6. Continuing gathering and analysis of evidence-based research results at the Public Health Agency of Sweden, the National Board of Health and Welfare and the National Centre for Suicide Research and Prevention of Mental Ill-health at Karolinska institutet, and assign the National Board of Health and Welfare to initiate a campaign to increase the knowledge of suicide, 7. Assigning the Public Health Agency of Sweden and the National Board of Health and Welfare to increase the competence level regarding care for individuals with suicidal behavior patterns, 8. Making sure that all suicides within the realm of or related to the healthcare system are reported to the National Board of Health and Welfare, and 9. Supporting voluntary organizations working with suicide prevention. Documents from the institutions focus on different aspects of suicide prevention and reveal more specific measures.

5.4. Case 4 – Vision Zero for patient safety

5.4.1. Policy decision

In 2008, a government inquiry (Swedish Government Official Investigation, SOU 2008:117) with the task to overview the existing laws and regulations connected to patient safety, was presented and the main conclusions were that they were not adequate to ensure patient safety. Based on research and policies in other safety-related areas, the inquiry called for a system's approach instead of the existing focus on correcting human errors. The main suggestion was to adopt a new law on patient safety with the main message that "…anyone managing health and emergency care should take all necessary precautions in order to make sure that patients are not injured in relation to health care". (Swedish Government Official Investigation, SOU 2008:117:20, our translation). This led to an adoption of a new law on Patient safety in 2010 (2010:659), where the responsibility of different actors was stated. In 2011, the government assigned (Swedish Government, 2011) the National Board of Health and Welfare to produce a national strategy for patient safety. In 2012, awaiting this strategy, the Swedish government made an agreement with the Swedish Association of Local Authorities and Regions on patient safety containing a Vision Zero (Swedish Government, 2012). The national strategy for increased patient safety was presented to the government in 2013 and contained a detailed Vision Zero as well as specific goals (The National Board of Health and Welfare, 2013). Numerous calls have since been made to coordinate the policy area better. A report from the National Audit Office in 2015, called for improved supervision, decision-making, and feedback (Swedish Government, 2015). Today, several regions have their own Vision Zero policies. The National Board of Health and Welfare is responsible for updated reports and for coordinating the field, but many actors are involved. Patient safety is also supervised by the Health and social care inspectorate dealing with complaints and irregularities in the health care system.

5.4.2. Policy problem

According to the national strategy, 100 000 individuals are injured

every year in relation to the Swedish health care system. It concerns approximately 9% of patients treated at hospitals. This is the main overarching problem. Another challenge is the large number of actors within the area as well as regional differences. The strategy states that a long-term vision concerning these problems is necessary.

The strategic documents do not outright identify the cause of injuries related to the health care system, but point to failures in leadership and structure, as well as unclear routines and regulations for individuals working in health care. The documents do not refer directly to the Vision Zero for road traffic safety, but the Government bill from 2009 (Swedish government, 2009) suggests that the patient safety work should be performed in a similar way concerning research and development.

5.4.3. Policy goals

The national strategy, as well as earlier documents, has been inspired by a system's approach and specifies a Vision Zero;

> "The vision zero is the image of a future where human beings do not die or are seriously injured in the health care system or dental care. The vision zero is […] an ethical approach […] to prevent human beings from dying or being seriously injured. […] …that the health system is developed with regards to the fact that humans make mistakes […] The infallible human being does not exist."
> The National Board of Health and Welfare, 2013:8, our translation.

The national strategy contains five long-term effect goals focusing on the patient. First of all, the strategy calls for a suitable patient safety culture within health care, second, patient participation in her or his care, third, reduction of the number of frequent or serious health care injuries, fourth, the right knowledge at the right time, and fifth, increasing knowledge about effective measures (The National Board of Health and Welfare, 2013).

5.4.4. Policy measures

The documents identify 16 areas of measures. The measures are to be implemented in the health care system on both regional and local level and they focus on both private and public health care facilities.

There is a need to clarify the responsibility of different roles related to the quality of patient safety. It is also vital to introduce systematic quality assessments as well as identifying the link between patient safety culture on one hand and injuries on the other. Systematic evaluations are called for as well as using the results for improvements. The strategy identifies measures to involve patients; to utilize the experience of the patient, and to ensure that all actors have knowledge about the rights of the patient.

In order to reduce the number of injuries, the strategy suggests identifying risks and adopting measures on all levels to prevent frequent and serious injuries. The strategy focuses particularly on vulnerable groups. Another measure is to increase the knowledge about injuries within municipal health care, psychiatric care, primary care, and dental care.

The goal to have the right competence at the right place and time will be reached by making sure that risk management is included in education and that such knowledge is also provided to new employees and continued in-house education. Competences should be constantly updated. The final measure is to provide resources for developing new methods for patient safety, such as local and national effect evaluation methods.

5.5. Case 5 – Vision Zero for fatal accidents in the workplace

5.5.1. Policy decision

Based on an increased number of work-related injuries and that individuals succumb to longer periods of sick leave, the Swedish parliament urged the government in March 2014 (Swedish Parliament, 2014) to initiate a dialogue regarding a Vision Zero for fatal accidents, to invest more in research and education, to make sure that all accidents are reported to the Swedish Work Environment Authority, and finally to produce suggestions for reducing bullying in the workplace. In compliance with the parliament, the government initiated in 2015 a dialogue with central actors aiming towards a creation of a government strategy for the modern workplace. The strategy was presented in 2016 and focused on three main areas; 1. Vision Zero for fatal accidents as well as preventing work-related injuries, 2. sustainable working life, and 3. the psychosocial work environment (Swedish Government, 2016a). Based on the strategy, the government has issued two new inquiries. The first (Swedish Government, 2016b Committee directive 2016:1) focuses on the current legal spaces for a modern workplace. The second (Swedish Government, 2016c Committee directive 2016:2) will concentrate on the forms of a new research center on the working environment. The later inquiry was presented in 2017, suggesting the establishment of a national research center for the work environment. Besides the government initiative, the Swedish Work Environment Authority issued new regulations regarding the work environment that were effective by March 31, 2016. The Swedish Work Environment Authority has a central role in analyzing and evaluating the policy area.

5.5.2. Policy problem

The number of work-related fatal accidents have decreased since the 1990 s', with a slight increase during 2012–2014. Looking at working life more broadly, the Government highlights the worrying trend of other work-related accidents and injuries. For instance the documents studied state that there is an increase in long-term sick leaves, particularly among women (Swedish Government, 2016a; Swedish Work Environment Authority, 2016). The trends regarding fatal accidents in the work place are related to several challenges. First of all, there is a clear "gender segregation" within the Swedish workforce and the fatal accidents therefore have different causes. Some areas are riskier than others and these are the male-dominated areas of construction, forest and soil industries, transport, and warehouse work. Most male accidents are related to equipment of some sort, while accidents in more female dominated areas are related to falls. Research show that gender equality often lead to a better work environment. Furthermore, globalization has an effect on working conditions as there has been an increase of short-term employments and an increased movement of people which has led to exploitation of certain groups, particularly foreign citizens. Another problem is the growing number of sub-entrepreneurs leading to unclear chains of responsibility and risk of human error.

The national strategy also points to companies not abiding by rules and regulations as a major factor leading to fatal accidents. The strategy suggests that there are problems concerning the legal spaces, leading to an unclear structure of responsibility. The documents refer to Vision Zero for road traffic safety and the two areas are described as interconnected.

5.5.3. Policy goals

The Vision Zero presented in the strategy is that; "No one should have to die as a result of their job. Concrete measures are necessary in order to prevent work-related accidents leading to injury or death." (Swedish Government, 2016a, our translation). Since this is a new Vision Zero policy, the goals are not specified at this point.

5.5.4. Policy measures

There are a number of ongoing and planned measures, such as the increase of supervision by The Swedish Work Environment Authority into companies breaking work environment laws in order to gain economic advantages. The same authority is analyzing fatal and other accident involving foreign citizens. The Swedish Work Environment Authority is also analyzing gender perspectives and in that assignment is also included communication, information, and education activities. In order to prevent fatal accidents in relation to road or railway work,

the Swedish Work Environment Authority is assigned to cooperate with the Swedish Transport Administration and the Swedish Transport Agency in identifying risks and vulnerable groups. The Swedish Work Environment Authority will together with the Swedish Chemical Agency, the Regional boards, the Swedish Environmental Protection Agency, and the National Board of Health and Welfare analyze the situation of foreign workers within the green businesses and make sure that they receive information about central laws. The Swedish Work Environment Authority is assigned to analyze in what areas breaches of current regulations occur. Finally, a joint mission is given to the Swedish Work Environment Authority, Swedish Employment Agency (Arbetsförmedlingen), Försäkringskassan (the Social insurance agency), the National Board of Trade, Swedish Competition Authority, Swedish National Mediation Office, the Swedish Migration Agency, the Swedish Tax Agency, the Swedish Institute, Business Sweden, the Swedish Agency for Economic and Regional Growth, and the National Agency for Public Procurement to produce a common strategy for and web-based information to foreign employers and workers.

6. Conclusions and discussion

6.1. Policy decision

The study of the five areas shows that the Vision Zero policies were formulated by different types of actors and on different levels of decision-making. The Vision Zero policies for road traffic safety and suicide was decided upon by the parliament, based on government bills, while the Vision Zero policies for fire safety and patient safety are government initiatives leading to national strategies formulated by area-specific authorities. The discussion regarding fatal accidents in the work place was initiated by the parliament, leading to a new government strategy containing a Vision Zero. As there are a number of inquiries initiated in regarding this policy area, it is too soon to grasp its further advances towards more formal parliament recognition or national strategies.

A parliament approval means that a proposal has a broader backing than just governmental and has played a role in the legitimacy of Vision Zero for road traffic safety. The material does not indicate that a parliament decision has played a pivotal role in granting legitimacy to other Vision Zero policies. For example, the knowledge on Vision Zero for suicide does not seem to be widely disseminated and there are a lot of criticism towards the initiative despite approval on parliament level. The lack of parliament decision regarding fire safety and patient safety, can provide an explanation as to why these areas seem to struggle with regards to coordination on national level. On the other hand, being formulated from below by actors within the policy area, can enhance the internal legitimacy of the vision. The material thus show a policy variation in terms of decision-making actor and level and there are no indications that the areas are imitating each other concerning institutional issues such as bureaucratic and administrative routines.

6.2. Policy problem

The descriptions of the problem both differs and are similar. The description of societal harm is similar; that too many people die or are seriously injured in relation to each policy area. All the areas, except fire safety, have embraced a system's approach, which means that failures in the system design is the cause of accidents. All policies show an acceptance for human mistakes, although somewhat less pronounced in relation to fire safety. Concerning suicide, the documents state that the institutions within the area are not able to hinder suicide nor providing enough support to individuals at risk. In the area of patient safety, various reports and policy documents identify structural aspects, such as unclear instructions and guidelines, as the main problem, not the actions of individual health workers. The recent documents on workplace safety identifies companies not abiding by the rules as a major problem, although recognizing the inadequacy of the current legal framework. It is clear that a majority of the Vision Zero policies identify the system design as the main cause and system designers as responsible, without removing the responsibility of the individual. This indicates that the shift towards problems with the system design does not exclude human errors as a problem. But shifting the focus towards system design acknowledges that there will never be such a thing as the perfect human being which has consequences for what policy measures to take. It is unclear though, at least in the textual framing of each policy, what the system consists of. There is a complicated web of actors and the problem description is complex, particularly regarding suicide. As we will return to shortly, there is a link between the clarity of the policy formulation and the level of systematization and organization of the policy measures, which entails a direct effect on the actual outcome.

6.3. Policy goals

The goals within the Vision Zero policies for road traffic safety, fire safety, and patient safety are all formulated in a similar way focusing on eliminating deaths or serious injuries. The Vision Zero for fatal accidents in working life focuses on deaths and accidents in general while the Vision Zero for suicide states that no one should have to be in a situation where suicide is the only option. Depending on how accidents and serious injuries are defined, the goals can be considered precise.

Suicide is the only policy area where there are no effect goals, apart from within working life, where these may come into place eventually. The measurability of the Vision Zero policies depends on the correctness of the statistics and one way to measure progress within the areas is to use effect goals.

The areas of road traffic safety, patient safety, and working life safety are similar in that sense that incidents often take place away from home, while fire safety and suicide is more often connected to our homes, but with the huge difference that there is an entire fire rescue organization connected to the first area. The similarities between the first three areas indicate a rather straightforward goal formulation and a clear connection with the problem formulation. The area of suicide stands out in several aspects. We can at this point only speculate whether this policy variation is a reflection of the ambivalence within the policy area whether Vision Zero is a workable tool. A lingering question is also whether the goals are obtainable. Tapping into the scientific discussion on Vision Zero, some say that the goal is unrealistic, while others conclude that obtainability is not the point here, but rather the road getting to zero.

6.4. Policy measures

It is clear that the Vision Zero measures within road traffic safety are directly linked to the goal of eliminating accidents where people die or are seriously injured. Less serious accidents are thus acceptable. This has led to a focus on measures regarding reduction of harm related to vehicle safety and road design. The question is if less serious accidents are acceptable within the other four areas just as long as they will not lead to deaths or serious injuries. The measures within the other areas are focusing on coordination between authorities, information campaigns, education, research, evaluation, and coherent statistics. The Vision Zero policies all involve many actors but suicide, patient safety, and workplace safety stand out regarding complexity of levels and actors. Concrete measures will therefore to a great extent depend upon coordination and clarity regarding who does what and where. The coordination efforts could also be affected by the legitimacy of the policy decision which is linked to the decision- and policy-making level. Coordination is thus affected by the formal sphere of influence but also the informal sphere of influence, often related to traditional means and methods within each sector. Further research is needed in order for a more in-depth understanding of the power relations in the policy areas covered in this article.

Table 1
Summary comparative Vision Zero policy analysis.

Policy content

Policy area	Policy decision	Policy problem	Policy goal	Policy measures
Road traffic safety	Parliament decision	System design, humans and human body not infallible	Eliminate deaths and serious injuries Interim and effect goals	Focus on safe and supporting vehicle and road design, coordination
Fire safety	National guidelines, government request	Individual	Eliminate deaths and serious injuries Interim and effect goals	Focus on information, local measures, technology
Suicide	Parliament decision	System design	No one should have to commit suicide Effect goals	Focus on information, coordination, knowledge-creation on the national level
Patient safety	National guidelines, government request	System design	Eliminate deaths and serious injuries Effect goals	Focus on coordination, increasing knowledge on national, regional and local levels
Workplace safety	Parliament request and government decision	System design and corporate responsibility	Eliminate deaths and accidents No interim or effect goals yet	Focus on coordination, education and communication on the national level

There seem to be an awareness of the link between measures and system design in all areas. The long tradition of coordinated work within fire safety and road traffic safety can explain why measures are more detailed and appearing more systematic than in the other three areas. The measures within all five areas are directed at all levels, but within fire safety the measures are particularly aimed at the local level, while the health care related areas tend to focus on national and regional coordination. The results reveal that there is a clear link between the design and formulation of a policy and the level of concretization of the measures taken. If the policy problem and the system are not clearly encircled, the measures have a tendency to be broad, vague, and incoherent, which leads to problems with both implementation and measuring the outcome.

All five policy areas rely on a combination of hard and soft measures, but the Vision Zero policies for road traffic safety, fire safety, patient safety, workplace safety in particular promote measures involving making structural changes to the physical environment in which injuries occur, i.e. roads, vehicles, buildings, tools, etc. This so-called engineering approach to safety (in contrast to traditional enforcement and education approaches) enables passive safety strategies, which do not require actions by individuals to be effective since they compensate for human mistakes and errors. Engineering approaches to safety are potentially feasible in clearly delineated areas such as roads, homes (fire safety) and work environment (workplace safety and patient safety), but more difficult to achieve with regard to suicide, a problem which is not restricted to one specific environment (see Table 1).

6.5. Policy variation

The study shows that the transfer of Vision Zero to other areas is not merely a question of terminology as there are more in-depth similarities, but how can we understand the differences? First of all, it is important to understand that there are many *contextual factors* making each sector and policy area unique such as set of actors and preconditions. A key contextual factor is the culture of each sector, particularly organizational, political, and epistemological culture, as well as moral and ethical principles. These aspects set the frame of the sector, concerning limits and possibilities. The results indicate that the four newest Vision Zero policies are still in a formative phase where there is an ongoing debate, regarding for instance the identification of a system and of responsibility, based on sectorial traditions and cognitive frameworks. Availability of economic resources is another factor which seems to affect the four newest Vision Zero policies more as compared to the pioneering area of road traffic safety.

Second, the overall reason for making a *policy decision* to adopt Vision Zero is that the perceived success within road traffic safety (Strandroth, 2015) creates a window of opportunity and is thus a *motivational factor* for the other four areas. The success could also be linked to the search for innovation as well as economic motives, as the funding for road traffic safety has been considerable since the adoption of Vision Zero. The policy decision is in two cases made on parliament level. In two cases on national authority level and one possible explanation is that these authorities have a strong position within those contexts. Another possible explanation is that the problems within those policy areas are not considered urgent. There are no visible coercive measures, such as laws, explaining the decision level. Our results indicate that the belief in Vision Zero is strong among politicians, as we can see in the case of formally adopting a Vision Zero related to suicide despite resistance.

Related to *policy design factors*, such as *policy problem, policy goal and policy measures*, the five areas show a great difference in the ability to systematically describe and analyze the policy problem and to link problem, goal, and measure. The question here is if it is necessary to adhere to all principles of the Vision Zero program in order to attain success. How different parts of a public policy interacts is also connected to the system in each area. If the system is not clear, the components of the policy will be difficult to identify as well as the link between them. This seems to be more urgent for suicide and fire safety. This, once again, show the importance of understanding the link between policy formulation and the actual outcome.

The variation in policy measures can also be explained by *temporal factors*. Time is related to available resources as well as ideological windows of opportunity. It may be easier to adopt an entire policy program if it has been evaluated over time. On the other hand, there is a risk of adopting a package not in line with contemporary challenges. The Vision Zero policies are at different stages of development and some require more coordination while others are in an implementation phase.

To sum up, fire safety, suicide, patient safety and workplace safety display a policy design based on both learning and imitation as a *method*

of adoption. The goal formulation and description of a system's approach show signs of mimicry in most cases, while decision-making, measures, actors, and administrative routines exhibit many differences. Even though their Vision Zero policies relate to the road traffic safety work, there does not seem to be the same systematic and grounded work of designing the policy.

7. Concluding remarks

The results indicate a number of important questions for further discussion and research. Can and should Vision Zero policies be implemented in different types of policy areas? Using fatal accidents in the workplace as an example, it is unclear why the government suggested a Vision Zero in an area where fatalities are decreasing. One possible explanation and for future research to address, is that the ethical and moral principles of Vision Zero apply regardless of trends. Another explanation can be international commitments.

Another question is to what extent are we witnessing a process where Vision Zero policies are adopted because it is more of a "hip" term than a realistic initiative in some areas? Vision Zero policies are also often confused with "Zero Tolerance". It is vital to keep these concepts apart. While similar in intention, they usually target opposite sides of the cause-consequence relationship.

Vision Zero policies place expectations and demands on practitioners and decision-makers. Are the visions considered realistic by those expected to implement and carry out various components of the policies? To what extent do these visions account for bottom-up perspectives by the "street-level bureaucrats" and to what extent are they viewed as top-down decisions? Finally, there is a need for further investigation into the implementation processes of each Vision Zero policy and such studies will hopefully provide an in-depth understanding of cultural factors, such as basic moral and ethical principles promoting or hindering a shift in the understanding of responsibility and systemic aspects. We also call for further studies on Vision Zero for road traffic safety in an international context.

So, in conclusion, and in the light of the steady increase of Vision Zero policies, which criteria seem reasonable to meet for a policy intended to be efficient related to personal safety and injury prevention? Based on the above observations and analysis, the following list can be proposed:

- Recognition that a clear definition of the policy problem is a necessary prerequisite in order to enhance measurability which in turn alleviates a long-term documentation of both the problem and progress made. This link between all parts of a policy process can enhance the ability to reach both short-term interim goals as well as long-term goals.
- Access to solid empirical data on the magnitude and historical development of the problem at hand.
- Access to a range of feasible hard and soft measures, including engineering approaches that enable passive safety strategies that compensate for human mistakes. This implies that measures on both a system level and related to human behavior are implemented alongside each other.
- Access to realistic strategies to control the problem, including system conceptualization, identification of key actors, program theory and evidence-based measures on single sub-problems.
- Application of a long-term working process in accordance with generic principles for continuous improvements, including surveillance, analysis, innovation, implementation, and evaluation.
- Assignment of leadership, authorities and resources sufficient for successful policy implementation and sustainability.

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