

Contributed Articles

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Lost in translation: Translating injury research into effective interventions

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Despite the existence of many effective interventions, more than 1.3 million people worldwide die from road traffic injuries. Another 20 to 50 million suffer serious injuries [1]. Many, if not most of these injuries are preventable. While effective interventions exist to prevent many traffic-related injuries [2], they are often not available or are simply not used to save lives. This is a problem of translation.

This situation is similar to developing a life-saving drug but not telling doctors about it, not packaging it for easy use by consumers, not giving it to pharmacists to dispense, and not helping people use it properly. This gap between research and practice, and between discovery and delivery, is large and continues to impede our progress in preventing and controlling injuries and violence [3]. For maximum impact, effective road safety interventions require widespread, sustained use by a large segment of the population. These issues are the focus of this paper.

The importance of translation in injury prevention

Diffusion is the process of moving an innovation – an idea, product, or practice – into widespread use. The process includes dissemination – spreading the word about a product, practice or idea; implementation – adopting and using it properly; and promotion – assuring its widespread use. The best interventions have little chance of achieving a public health impact if they do not end up in practice or are not translated into policy.

For many years, injury prevention researchers have assumed that an intervention deemed efficacious in an experimental setting will easily (or often automatically) be translated for use

in the field of practice. Unfortunately, this is not the case. There is little empirical evidence from diffusion research on how to do translation most effectively. Oldenburg, Sallis, French, & Owen (1999) [4] reviewed 1210 articles in 12 public health journals and discovered that less than only 1 per cent were characterized as diffusion research and only 5 per cent as policy implementation research. Only 8 articles in the entire database were related to injury, and virtually none were focused on translational research.

A fundamental shift in the concept of intervention research is underway – a recognition that research does not end when a study demonstrates an intervention is effective [5-9]. The scientific language and intervention protocols used by the original research team must be translated into everyday terms for use by practitioners, and materials must be developed to help guide the end users (for example, health departments and community-based organizations) in adopting and implementing the intervention.

In this view, researchers remain essential to the process. They understand best what made the intervention effective, know the training and technical assistance provided to their staff, and can provide guidance on the range of modifications that would be appropriate (or inappropriate) in practice. Because translation activities can involve curriculum development and multimedia formats to support training and implementation, the original researchers may not be the best persons to undertake these translation tasks, but they can be important consultants to the process. This is why collaboration between researchers and policy makers, advocates, media experts, and social marketers is often necessary to achieve success in moving the science into practical use [10].

The complexity of translation

We acknowledge the complexity and effort involved in the process of taking interventions to scale. A new intervention may call for individuals, organizations and communities to change their own behaviours, policies or norms. It may be met with user resistance, or personal or organizational delay, and result in rejection. These barriers can occur whether you are introducing a new style of bicycle helmet, installing a roundabout, implementing random breath testing, or introducing a texting-while-driving ban. We need to anticipate the possible range of responses as we plan for activities associated with dissemination and widespread use of road safety interventions found to work.

We also need to recognize that new interventions may compete with existing programs for scarce resources. It is important to provide the rationale, materials and other information that administrators or other decision makers need as they contemplate how to manage the process. These ‘gatekeepers’ often decide whether and how an organization will adopt the new intervention and, if so, whether new staff is needed to integrate the intervention into existing programs and manage the implementation effort.

Activities to facilitate translation

Research on translation and diffusion builds a bridge between experimental research and everyday practice by providing knowledge about how ideas, products, and practices are most effectively translated and transmitted for use by individuals and communities. CDC’s public health model identifies four stages in the progression from research to application, or from discovery to delivery: (a) defining the problem, (b) identifying

risk factors, (c) developing and testing interventions, and (d) increasing widespread use (Figure 1). Although this model provides a logical sequence of events, the progression from defining the problem to widespread use is by no means automatic. Each stage must consist of its own planned and sequential activities, and in each stage, researchers and practitioners must be prepared to address external factors that may introduce barriers.

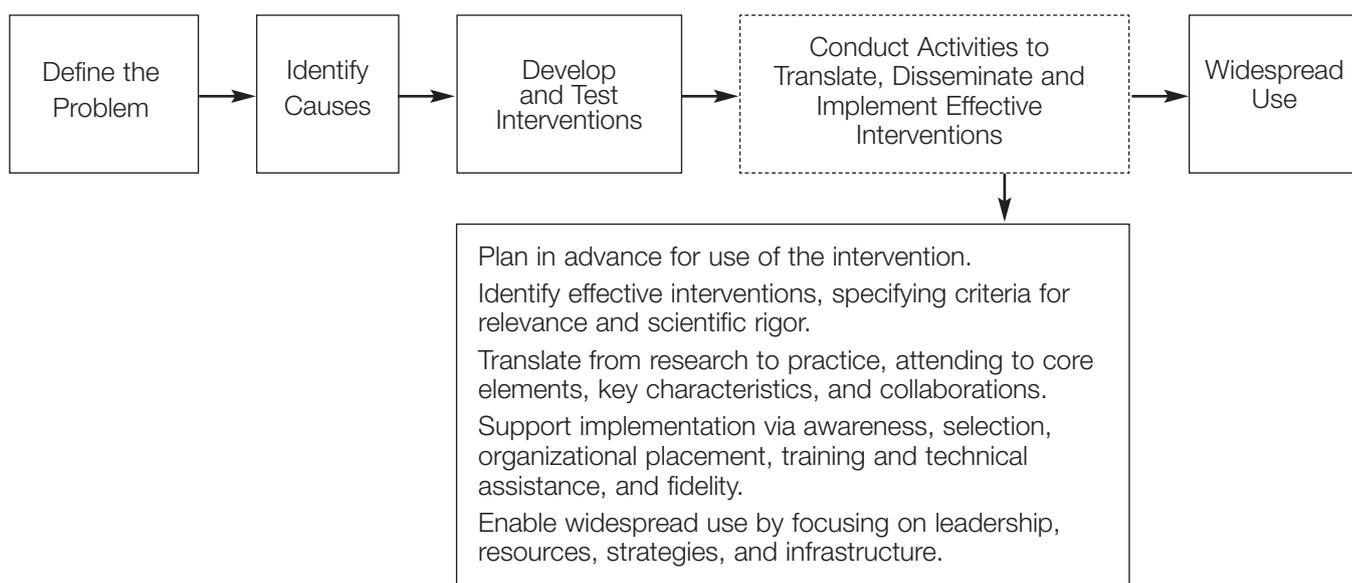
Once an intervention is successfully developed and tested, researchers may improve its perceived value and likelihood of adoption if they plan for translation by engaging in deliberate activities that fall within the public health model between ‘developing and testing an intervention’ and ‘widespread use’ as described in Figure 1.

Public health efforts in translation that have been successful

Research focused on how science-based interventions become prevalent in practice involves the study of processes that lead to improved translation. Whereas many interventions demonstrate effectiveness to prevent road traffic injuries, most have not been translated from research to lay language; tailored to be responsive to diverse cultural and societal norms; implemented in communities and evaluated for feasibility, fit with local needs; and delivered with fidelity. Consequently, they have not led to widespread acceptance or use.

In public health, after research has demonstrated the efficacy of a vaccine (for example, for diphtheria, tetanus, polio and smallpox), actions are immediately taken to translate those

Figure 1. Extending the public health model by interpolating translation activities



discoveries into prevention and delivery programs around the world [11]. When foods such as flour were found stripped of essential nutrients like thiamine, niacin and riboflavin, public health embarked on widespread nutrient fortification programs for all flour and white bread [12]. When bed nets were found effective in controlling malaria, public health delivered them to remote towns and villages.

Yet, when seat belts were found to reduce deaths and injuries by half, only some countries mandated their installation and use. Even today, 40 years after the seat belt ‘vaccine’ was discovered, the world is not protected by them. Road safety can bridge science and programs, but only if we make discoveries and then translate them into action and deliver them to those in need. Vietnam’s recent helmet law that achieved nearly 100% use on motorized two-wheelers is an example of that principle in action.



New helmet laws enforced in Vietnam

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Translation barriers and possible facilitators

Translation in injury prevention is more difficult than it appears, and it is important to learn not only about possible facilitators for this process, but also about barriers [13]. One important barrier is lack of communication about what translation entails, why it is important, and how to do it. Traffic safety agencies and organizations need to consider ways to make key road safety research findings widely available to the public, but also to manufacturers and lawmakers.

The obvious successes we have achieved through the development of innovative road safety products (e.g., air bags, speed bumps and motorcycle helmets), programs (e.g., random breath testing, ‘skipper’ or safe rides, alcohol checkpoints) and policies (e.g., speed limits, alcohol use policies, traffic calming measures) have, nevertheless, not yielded the uptake necessary to save hundreds of thousands more lives. This raises the need to conduct research on how to ensure these life-saving interventions get used [14].

Many constraints on translation can be linked to the ‘relative newness’ of the intervention, inadequate preparation and planning for public acceptance, implementation failure or lack of adequate funding to take the intervention to scale. A fundamental barrier to removing these constraints is lack of scientific knowledge about the translation process. Road safety generally lacks a dedicated infrastructure to support dissemination and implementation. Wherever an investment is being made in the development and testing of interventions, a parallel investment needs to be made in translation and implementing the intervention in other settings and with other audiences.

Understanding the core elements and key characteristics of what made the intervention work will require guidance from the original researchers. Coalitions, advocacy groups, public interest groups, citizens and professional organizations have an important role to play in translation. They can be primary change agents, convening and leading stakeholders, using their own networks to promote dissemination and implementation activities, and serving as opinion leaders, influencing spread. Another key role is as ‘linking agents’, which may be enforcement personnel, facilitating the smooth implementation of programs by providing resources to help translate and disseminate effective interventions, developing and providing training, and troubleshooting adoption and maintenance problems [15].

Cost-benefit, cost-utility and cost-effectiveness research on translation is lacking. Knowledge about costs would inform the dissemination and implementation process and assist approaches to achieving nationwide use. Collecting or modelling implementation cost information would help practitioners and end users as well, as they contemplate adoption and use of new policies, practices or products. Those who fund road safety intervention effectiveness studies could include, at a minimum, collection and estimation of implementation cost data as a component of the study.

Many of these possible strategies for improving widespread use of effective interventions depend on system-level change [16, 17] – such as road building and maintenance systems, vehicle manufacturing systems, enforcement systems and legal frameworks. Such change is likely to be evolutionary and may encounter resistance along the way. Still, looking at the progress many fields have made already, such change appears to be ultimately welcomed and worthwhile in road safety. Some common barriers to translation of research are summarized in Figure 2.

POLITICAL WILL – Lack of political will in communities and by governments.

SYNTHESIS – Limited synthesis of road safety research findings.

COMPLEXITY – Road safety issues are multi-factoral and complex.

TAILORING – Translation efforts need to be tailored to different target groups, under different conditions, in different settings. They also need to be culturally appropriate.

EFFECTIVENESS – Road safety interventions need to be tested in real world conditions.

GOALS – Unrealistic goals for innovations in road safety and the timetable expected for adoption and implementation is too aggressive.

EVALUATION – There is limited information on the long term outcomes of translation research.

COMMUNICATION – There are differences between how road safety researchers, legislators, and practitioners communicate.

ROAD MAP – Researchers are not taught how to, nor do they plan for, widespread dissemination of their findings outside the road safety field.

RESOURCES – There are limited financial and human resources for widespread dissemination.

Figure 2. Barriers to the translation of research

Future directions

While many examples of successful translation abound in cancer prevention, HIV, heart disease, physical activity and smoking prevention [15, 18, 19], road safety has lagged behind. We may finally be able to address this opportunity by dedicating more resources into translation and implementation research.

Federal agencies and not-for-profit organizations like ACRS can and must be catalysts in initiating and sustaining these efforts, including translation research in road safety. This leadership may take the form of training injury researchers, providing annual prize for translation researchers, sponsoring interdisciplinary meetings, workshops, and conferences where researchers and practitioners—in road safety and other disciplines—can share their approaches to discovery and delivery of innovative road safety research.

Kok and Green [20] cite the findings from the Dutch Smoking Prevention Program for adolescents as an example of what can happen if we do not pay attention to these needs: ‘After 4 years of careful and internationally respected research and development, deVries and co-workers presented their programme to be implemented nationwide. Now, almost 2 years later, absolutely nothing has happened.’ Road safety can learn from this example of failure, and invest in specific activities to ensure the successful translation of effective traffic injury interventions of benefit to the public.

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