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Suicide prevention in railway systems: Application of a barrier approach

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Abstract

This study is part of a broader research program aiming at safer railway systems with regard to suicide risks. The specific aim of this paper is to theoretically derive and categorise a set of railway suicide prevention strategies with special regard to measures under the potential control of the railway system-owners.

The methodological approach departs from synthesizing generic accident and suicide prevention models. Secondly, potential barriers are identified by means of fault tree analysis (FTA), and thirdly results from this analysis are validated against Haddon's ten energy-based injury prevention strategies.

Our results include 20 separate preventive strategies, of which most are in reach of railway system-owners themselves. Four of them aim to reduce perceived attractiveness and availability, nine aim to influence accessibility to track areas and the potential of collision, five strategies aim to mitigate consequences of collision, and three encompass medical survival and recovery strategies.

To evaluate the barriers' practical feasibility, etc., is beyond the aim of this study. However, technological development and innovations may turn less realistic alternatives today into more realistic possibilities tomorrow, as has been proven in other fields.

Keywords: Railway; Railroad; Suicide prevention; Barrier; Accident analysis

1. Introduction

Self-inflicted injuries, such as suicides and suicide attempts, constitute a major public health problem. The World Health Organisation (WHO) estimated for the year 2000 that about 815000 people died from suicide, globally. In the age group of 15–44 years, suicide is the fourth leading cause of death (Krug et al., 2002). Suicide prevention is therefore a field of urgent concern.

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The psychiatric care plays a major role in suicide prevention, but also other actors and system-owners show increased awareness and readiness to contribute. Different societal bodies search for their part in the planning and design of physical and organizational environments to make them less harmful. The aim should be to make these environments more supportive for psychological wellbeing in general, and less tempting as a scene for suicide.

In Sweden, with a population of about 9 million, 1200–1500 persons commit suicide annually. About 5% of these events occur on railways. The main national provider of rail networks in Sweden, The Swedish National Rail Administration, has initiated an effort to develop broader understanding of the suicide problem connected to the railway system, and of the possibilities to prevent suicides by systems-oriented measures.

In a previous study, suicide events within the Swedish railway system have been investigated for the three-year period 2000–2002 (Rådbo et al., 2005). The results show that a majority (75%) of all events defined as collisions between an unprotected person and a train are classified as suicides, the rest as accidents in a traditional sense (8%) or as events with unknown intent (17%). More then 85% of all train–person collisions occur in densely populated areas and almost 75% of the victims are reported to await approaching trains for some time on the tracks or in their immediate surroundings before being hit.

Besides the tragedy directly related to the victim, these events inflict severe trauma among relatives, professionals and others involved. The capacity of the rail transport system to operate timely and effectively is also hampered.

The aim of this paper is to theoretically derive and categorise a set of railway suicide prevention strategies with special regard to measures under the potential control of the railway system-owners.

The barriers elaborated theoretically are intended for further empirical use in support of in-depth investigations, as well as for the evaluation of their practical applicability and preventive potentiality.

The methodological approach in this paper is threefold:

- Comparison and synthesis of generic accident and suicide prevention models in order to determine critical events and stages along the injury causation process.
- Barrier identification by means of fault tree analysis (FTA), and with reference to critical events and stages indicated in the synthesized process model.
- Triangulation of barriers based on Haddon's ten energy-based injury prevention strategies.

2. Combining suicide and accident prevention principles

Comprehensive sets of accident-injury prevention models have been reviewed and discussed elsewhere (Andersson and Menckel, 1995; Kjellén, 2000). However, theoretical developments in "suicidology" largely emanate from other traditions than accident and injury prevention. Suicide analysis and prevention is widely guided by the so-called suicidal process model, which refers to a process that starts with escalating suicidal thoughts and results in a decision to commit suicide and to act out (Beskow, 1979). Although the phenomena of suicide and accident may differ with regard to intentionality, they both result in physical injury. In addition, it is claimed that the difference in intentionality is largely illusory, and that suicide acts often can be described as "psychological accidents", i.e. situations characterized by critical loss of human control (Beskow et al., 1994). These observations have inspired suicide researchers to seek combined models for suicide and accident prevention. Beskow et al. (1994), with reference to railway suicide, propose a synthesis of the suicidal process model and Haddon Matrix (Haddon, 1980), including the following stages:

Pre-crash phase
- Decision to give up life.
- Decision to commit suicide.
- Choice of method (jumping before a train).
- Acting out (through jumping).

Crash phase
- Consequences of the act.