

## Research paper

# Suicides in commuting railway systems: The case of Stockholm county, Sweden



Vania Ceccato\*, Adriaan Uittenbogaard

Housing and Safety Research Group, Department of Urban Planning and Environment, School of Architecture and the Built Environment (ABE), Royal Institute of Technology (KTH), Drottning Kristinasväg, 30 10044 Stockholm, Sweden

## ARTICLE INFO

## Article history:

Received 23 October 2015

Received in revised form

29 January 2016

Accepted 25 February 2016

Available online 9 March 2016

## Keywords:

Trains

Environment

Suicide prevention

Space-time analysis

LISA

Getis-Ord

Gis

## ABSTRACT

The objective of this study is to understand the spatial and temporal dynamics of suicides in commuting railway environments. Data on suicides in Stockholm commuting railway from 2006 to 2013 was analysed. The study sets out to identify significant clusters in suicides then evaluate whether commuting railway environments affect variations in suicide rates. Fieldwork inspection, spatial cluster techniques (NNHC and Getis-Ord statistics) and regression models underlie the methodology of study. Findings show no seasonality was observed in suicide cases, but winter months concentrate a larger share of events. Suicides do not occur evenly throughout the day but tend to take place more often in weekdays. Modelling findings shows that suicide rates increase with speed trains and decrease where barriers along tracks are installed. Although high speed trains are still a motive of concern for suicide prevention, findings call for a whole railway-approach to safety – one that extends maintenance beyond the platforms and stations' vicinities.

© 2016 Elsevier B.V. All rights reserved.

## 1. Introduction

Suicides in transportation environments are relatively few in number compared to suicides in other environments, yet these tragic events have a strong impact on society. Train suicides in particular incur high costs as a result of driver and bystander trauma as well as service delays (O'Donnell and Farmer, 1994). This may explain the more frequent examination in the international literature of suicides in railway environments as a phenomenon that may be prevented (Rådbo and Andersson, 2012). To date, studies have been devoted to temporal variations in suicides (e.g. van Houwelingen and Beersma, 2001; Erazo et al., 2005; Schmidtke, 1994), the demographic and socioeconomic circumstances of the victims (e.g. Emmerson and Cantor, 1993; van Houwelingen and Kerkhof, 2008) and the specific country or regional contexts of suicides (e.g. De Leo and Krysinska, 2008). However, this body of research lacks in-depth assessment of the impact of temporal and environmental factors on suicide events in railway systems, especially commuter train systems.

The objective of this article is two-fold. The study first assesses temporal and spatial patterns of suicide events in a commuter railway system. It then evaluates whether the commuter train and track settings affect variations in suicide rates, controlling for a

number of local and contextual factors using regression models and Geographical Information Systems (GIS). Commuter trains in Stockholm, Sweden, are the area of study.

We focus on collisions involving commuter trains, because they are the most frequent in rail transport, more frequent than in underground systems, for example. Yet, as suggested by Rådbo and Andersson (2012: 778), based on an analysis of data from 2005 to 2008 for Stockholm, the whole railway system is affected by these events. The work reported here builds on previous studies done by Rådbo et al. (2005); Rådbo and Andersson (2012) as well as on Uittenbogaard and Ceccato (2015) on suicides at underground stations. The study contributes new Scandinavian evidence (based on recently available datasets) to the international literature.

## 2. Suicide in transportation environments: theory and hypotheses

### 2.1. Suicide and the environment

Previous studies on suicides have suggested that the availability of 'lethal means' in the railway environment strongly favours its selection as a means of suicide (e.g., Erazo et al., 2005; Law et al., 2009). Yet, not all stations (or parts of the railway system, such as tracks) are equally likely facilitators of suicide. The key issue is to understand which environmental elements in the railway system can be installed, changed or removed and thereby

\* Corresponding author.

E-mail address: [vania.ceccato@abe.kth.se](mailto:vania.ceccato@abe.kth.se) (V. Ceccato).

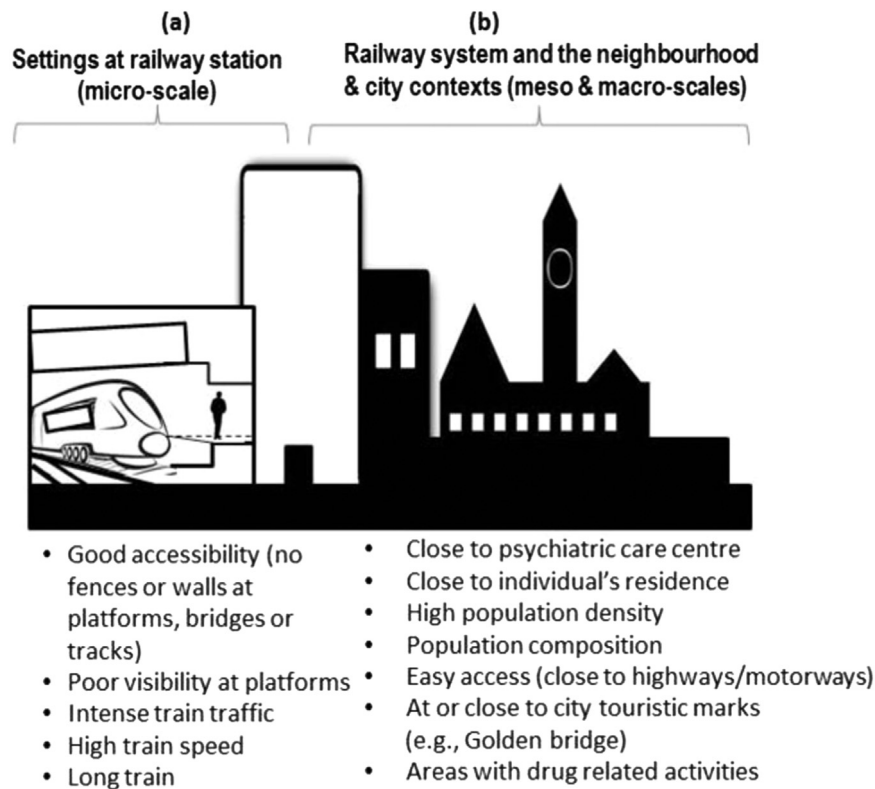


Fig. 1. Facilitators of suicide in railway systems.

save lives. A prevention strategy that targets the population as a whole, such as means restriction, has many advantages, especially when implemented through 'distal measures', in other words, measures that make it difficult for an individual to carry out suicide (Yip et al., 2012). Similar approaches have been applied widely in criminology and suicide studies, under the label of 'opportunity-reduction theory' (Clarke, 1997). Instead of focusing on individuals, an opportunity-reduction approach introduces discreet managerial and environmental changes to reduce opportunities (see also Clarke, 1994; Clarke and Poyner, 1994).

Fig. 1 summarises a number of characteristics of the stations and tracks (including traffic) and their environmental contexts (neighbourhood and city-wide) that have been associated with suicide in the international literature. There are micro-environments or settings in the railway system (stations, tracks, bridges) that increase opportunities for suicide, especially by jumping (Fig. 1a). In a study in the Netherlands, Houwelingen et al. (2010) found that most suicides occurred on open stretches of track, away from stations (55.6%), while 18.7% happened at the platforms and 25.7% at level crossings. These results are similar to those found in the United Kingdom (Clarke, 1994; Clarke and Poyner, 1994) and Australia (Krysinska and De Leo, 2008), where a majority of railway suicides occur on open tracks. In contrast, in Germany most suicides in railway settings were carried out in stations, at the platforms (Schmidtke, 1994). A study in Sweden (Rådbo et al., 2005) showed that suicides were often carried out a short distance away from the stations and platforms, in locations out of sight where victims generally waited a period of time for the trains to arrive. Similarly, Uittenbogaard and Ceccato (2015) found that more than half of the variation in suicide rates in the Stockholm underground system was associated with stations that have walls between the two sides of the platform (poor visibility). Yet, Houwelingen et al. (2013) found that the amount of train tracks, familiarity with the railways and perception of easy accessibility to them did not appear to influence suicides in the Netherlands.

Moreover, train traffic exhibits some features that are particularly important in the choice of location for a suicide. For example, using data for the Stockholm area that compared train frequency along different track sections, Rådbo and Andersson (2012) found suicides considerably overrepresented among high-speed trains (airport express line) though commuter trains passed the same tracks more frequently, at a slower speed. Similar findings were reported by Niederkröenthaler and Sonneck (2007) for the underground in Vienna.

Other features are associated with a reduction of deaths in transit systems. For instance, the installation of platform screen doors (Law et al., 2009), barriers and wire fences close to tracks and stairs (Bennewith et al., 2007), and metal screens fixed above concrete parapets on bridges (Beautrais, 2001) appear to reduce suicide cases. CCTV can help staff and train drivers to identify danger quickly (Clarke and Poyner, 1994). Drainage pits by the platforms provide a space between the train and the platform that may reduce mortality when a person falls or jumps onto the tracks (Coats and Walter, 1999). Matsubayashi et al. (2013) initially suggested that the installation of blue lights prevented railway suicides, but that was later reassessed by Ichikawa et al. (2014), who indicated that even if blue lights have some effect preventing railway suicides at night, their effect is much smaller than previously estimated.

Certain parts of the city have higher concentrations of suicide (Fig. 1b). Variations in suicide frequency across neighbourhoods can be associated with more opportunities or suicide facilitators. For instance, several studies have indicated that suicides tend to occur close to psychiatric care centres. This is because a large share of victims of train-related suicides have been under psychiatric treatment at the time of suicide, especially in-patients with severe illnesses (van Houwelingen and Kerkhof, 2008; Houwelingen et al., 2010). Suicides have also tended to occur in high-population-density areas (Krysinska and De Leo, 2008; Kerkhof, 2003; Clarke and Poyner, 1994; O'Donnel and Farmer, 1994) and close to

Download English Version:

<https://daneshyari.com/en/article/6230222>

Download Persian Version:

<https://daneshyari.com/article/6230222>

[Daneshyari.com](https://daneshyari.com)