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Understanding slips, trips, and falls among older rail passengers: Future-proofing risk

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1. Introduction
The on average 30\% of adults over the age of 65 years fall each year, with 1 in 5 of those falls requiring medical attention (Gillespie et al, 2012). With an ageing population across parts of the world (e.g. United Kingdom, Australia, and the United States of America), the number of older passengers (over the age of 65 years) using public transport (i.e. railways) is likely to increase, with implications for the design and use of train stations (Currie and Delbosc, 2010; DTI, 2000; Palacin, 2011; RSSB, 2008, 2011).

2. Method
A systems based approach was used to identify factors that contribute to slips, trips, and falls (STF) in older rail passengers. The research consisted of stakeholder interviews (n=44) with experts from within rail and across other industries (i.e. healthcare, aviation), station observations (n=11); older passenger interviews (n=18, aged 67-94 years, 8 females: 10 males); and a survey of station managers (n=66). Participants were recruited on a structured convenience basis, sampling participants from the chosen sample groups most likely to be able to provide useful insights into the problem under investigation. Data were analysed iteratively using hybrid thematic analysis, with data driven codes developed, and emergent overarching themes identified (Bryman, 2004).

3. Results
Factors that impact STF in older rail passengers were categorised into organisational influences, influences within the station environment, and individual influences (based on previous models by Haslam and Stubbs, 2006; Bearfield et al., 2013; and Rasmussen and Svedung, 2000). Issues were then classified as high, medium and low priorities for reducing older rail passenger STF in the future (2014-2050). High priorities included:

- Organisational influences: the provision of assistance services (understanding and improving the service offered to meet the requirements of vulnerable passengers, staff awareness).
- Environmental influences: the impacts of weather (enhancing stations to combat changes in weather), sensory distractions (dealing with advances in technology that may impact the awareness of passengers, including wearing headphones or using mobile social media), escalator safety (understanding and reducing the dangers, appropriate signage, alternative lifts, passenger awareness), and considerations surrounding crowding (population increase, pedestrian flow, fire safety and evacuation).
- Individual influences: issues surrounding mental health (likely to rise with the ageing population, requiring staff and passenger awareness).

Issues highlighted as areas of high priority should be the focus of research and interventions to reduce STF among older passengers in the future (2014 to 2050), based on our findings.

4. Discussion
Our research used the Haslam and Stubbs (2006), model of STF, along with the Bearfield et al (2013) Bayesian model of STF that occur at the train platform interface specifically, to enhance understanding
surrounding STF of older passenger at train stations across Great Britain. Our findings provide insight into priority areas to target future rail safety interventions, with the aim of improving the experience (safety, comfort, satisfaction and performance) of older rail passengers, and ultimately reducing STF. Findings will be used to develop a systems model of factors (including those of high, medium, and low priority) that contribute to STF among older passengers.

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References