

Increased likelihood of injury among differently abled and elderly travellers: evidence from urban metro subway systems.

Cohen, Judith M., Barron, Alexander S., Anderson, Richard J., and Graham, Daniel J.

Railway and Transport Strategy Centre, Centre for Transport Studies, Dept. of Civil and Environmental Engineering, Imperial College London, London, United Kingdom SW7 2AZ, UK

judith.cohen@imperial.ac.uk

alexander.barron@imperial.ac.uk

richard.anderson@imperial.ac.uk

d.j.graham@imperial.ac.uk

Abstract

The concept of 'transport disadvantage' recognises ways in which some people have more difficulty than others in accessing the transport system, using certain transport modes, and accessing certain locations. We contend that increased likelihood of injury whilst travelling is a form of transport disadvantage, using data relating to falls in urban metro subway systems (metros).

Data for the proportion of journeys and falls involving elderly and differently abled passengers were collected using questionnaires to 26 metros which are members of the CoMET and Nova metro benchmarking groups. These groups provide a global sample of metros in major and secondary cities across five continents.

Elderly and differently abled passengers were found to comprise 1%-20% (median 5%) of metro passengers. This wide range is attributable to differences in accessibility and differences in recording practices and definitions. The proportion of trips and falls involving differently abled and elderly passengers also varied widely for similar reasons. Differently abled and elderly passengers were involved in 1%-65% (median 35%) of falls anywhere in the metro, 1%-29% (median 10%) of falls on stairs, and 4%-78% (median 40%) of falls on escalators.

The proportions of passengers and of falls involving differently abled and elderly people were used to calculate the relative risk to passengers in those groups. We found that the relative risk to elderly and differently abled passengers is higher than for the general population. Differently abled and elderly people are 7.7 times more likely than the general population to fall anywhere in the metro. Escalators are identified as a specifically high risk area, with elderly and differently abled passengers 6.9 times more likely to be involved in a fall.

We summarise good practices implemented by metros to mitigate risks and reduce this disadvantage. First among these is providing lifts to avoid the need to use escalators and stairs, as well as to improve general accessibility. Among 25 responding metros, 9 (mostly newer Asian and Latin American metros) had step free access at every station, 6 have lifts at 60-98% of stations, and 10 (mostly older metros in Europe and North America) had step free access at <40% of stations. Among metros with lifts at every station, a number had specific campaigns aimed at encouraging elderly and differently abled people to use the, involving posters and staff interventions. Limited evidence indicates that these campaigns successfully improved safety.

To our knowledge, this paper is the first to quantify the relative risk to elderly and differently abled passengers in metro systems. By doing so, we demonstrate that elderly and differently abled passengers are disadvantaged by an increased likelihood of injury whilst travelling. We therefore

investigate and disseminate good practices used by metro operators to mitigate this increased injury risk to differently abled and disabled passengers.

Keywords

Metro, subway, injuries, escalator, disabled, elderly