

Public health consequences of electric scooters for young people and adults

Effects on active mobility and accidents


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- Use of electric scooters primarily replaces walking, followed by public transport
- The reduced active mobility for young people can be quantified at around two minutes of moderate physical activity per person per day
- The risk of an accident is 5 to 7 times greater with an electric scooter than with a bicycle, and this is somewhat higher among young people than among adults
- Shared e-scooters replace somewhat more active mobility than privately owned ones, and also have a significantly higher risk of accidents
- The overall public health consequences of electric scooters are not possible to quantify, but are expected to be negative, even if increased social participation and mobility are taken into account

Background

The Norwegian Directorate of Health recommends a minimum of 60 minutes of physical activity per day. Research shows that young people walk and cycle less now than before. The same has been observed for the adult population. It is important to know something about the extent to which active mobility (walking and cycling) is reduced when people get access to motorized micromobility. From a public health perspective, it is also important to know something about the accident risk that occurs. It has been difficult to calculate the accident risk for e-bike riders due to poor exposure data and underreporting of accidents. Since electric scooters are particularly popular with young people, it is particularly interesting to gain systematic knowledge about whether there are differences in use and risk according to age. The purpose of this report is to provide a knowledge summary of Norwegian and international research on the effect of electric scooters on public health. More specifically, we seek to answer the following questions:

1. what is the effect of electric scooters on active mobility and total physical activity?

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2. what is the accident risk of electric scooters compared to cycling?
 3. is there a difference between owned and rented electric scooters?
 4. is there a difference in the effects for young people and adults?

Mobility changes

The results from the literature search indicate that electric scooters replace trips with active transport to a greater extent than other means of transport, and replace walking to a significantly greater extent than cycling. This particularly applies to shared electric scooters. There are few studies so far that have distinguished between the use of privately owned and shared electric scooters, and how that affected the mode of transport that is being replaced. The few studies that exist show that private electric scooters replaced walking and public transport to a lesser extent than rented ones, and to a somewhat greater extent replaced cars and bicycles. We see the same pattern in the Norwegian surveys, with one small exception: Among the youngest teenagers, it seems that private electric scooters replace walking trips to a greater extent than what we have seen among adults.

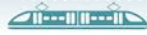
One of the advantages mentioned with electric scooters is that they can cover the "first/last mile" problem associated with public transport, and thus potentially increase the competitiveness of public transport compared to cars. At the same time, these trips constitutes a form of physical activity in everyday life. If this activity is not replaced with other forms of physical activity, the results may be less physical activity among those who travel by public transport.

What does this mean for active mobility?

The electric scooter primarily replaces walking and cycling trips. Even if there are some walking trips that will also be added, due to the fact that previous trips by public transport and car are being replaced (and rented electric scooters have a walking trip at least at one end), the overall effect is that active mobility is reduced. An estimate of the lost physical activity in Norwegian municipalities with medium to high use of electric scooters is 5.6 MET minutes, i.e. about two minutes of moderate physical activity, per person for the age group 13-22 years. For those under the age of 17, this amounts to approx. 3% of the daily need for physical activity, while for those over 17 this amounts to just under 10%. Although this is not a big dent in the daily "activity budget" of the average population, it can be a significantly negative contribution for some people who are not physically active in the first place. If you are a person who does not train or exercise, the daily short walking and cycling trips will be one of the few opportunities you have to meet the recommended level of daily physical activity.

Accidents and risks

From the international literature, we find very different results for the risk of accidents with electric scooters. Summaries of emergency ward data estimate that electric scooters have anywhere from the same to twice the risk of accidents as ordinary bicycles. If we look at hospitalizations, we find significantly greater differences, with anywhere from 10 to 60 times higher risk. A challenge with these figures is that trips



are used as the exposure measure. A bike trip can typically be 3-4 times longer than an electric scooter ride, which will contribute to the risk of accidents with electric scooters being systematically underestimated. A re-analysis of Norwegian emergency ward data, as well as analysis of self-reported accidents in two Norwegian research projects led by TØI (MikroReg and UngSpark project) gives a relatively consistent picture of the risk. Based on this, we find that electric scooters have five to seven times higher risk of accidents compared to bicycles. Compared to adults, young people seem to have a higher risk of accidents with electric scooters. Privately owned e-scooters have a significantly lower risk of accidents than rented ones, which is probably due to less drunken driving, as well as the fact that the users are somewhat more experienced. It is to be expected that this picture will change somewhat and that the general risk will fall somewhat, with the introduction of stricter regulation and with increased experience among users. But it is unlikely that electric scooters will ever be as "safe" as bicycles.

What is the overall public health effect?

The survey results reported here show that some of the young people report that they are more social, play less computer games, and exercise more often as a result of having access to electric scooters. However, it is difficult to quantify how much the reported increase in exercise contributes to reducing the lost active mobility. It is not expected that this effect will be able to fully compensate for reduced active mobility, but broad studies that look into total effects in populations with and without access to electric scooters are needed to give better answers to this. In addition to the lost active mobility, electric scooters have a significantly higher risk of accidents than the mode of transport it replaces. This applies to all age groups. Overall, the assessment is that electric scooters are a negative rather than a positive contribution to public health. For young people, which is the group that uses electric scooters the most, the negative effect is also greatest, since the risk of accidents is also greatest in this group.