

# Cost-effectiveness of road safety measures

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# Background and main problems

- An objective of further improving road safety is widely supported
- Many cost-effective road safety measures have already been implemented
- Major increases in funding for road safety measures cannot be expected
- To what extent can road safety be further improved by means of cost-effective road safety measures?
- A measure is cost effective if benefits are greater than costs

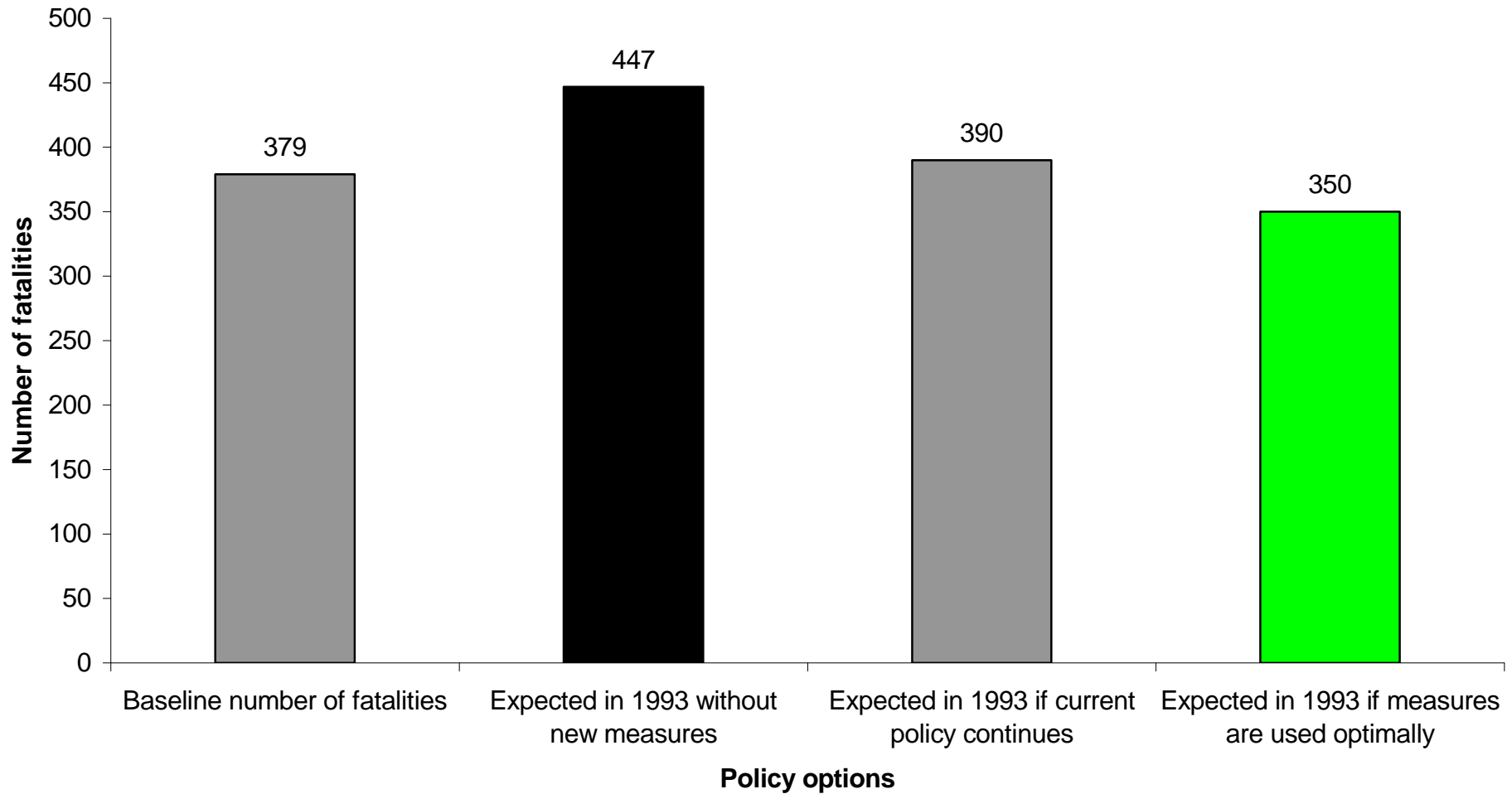
# Findings from road safety policy analyses

- Analyses of road safety policy have been made for:
  - Norway 1984
  - Norway 1999
  - Sweden 2000
  - Norway 2007
- All these analyses show that there is a great potential for improving road safety by means of cost-effective measures
- Current road safety policies do not fully employ all cost-effective road safety measures to the optimal extent

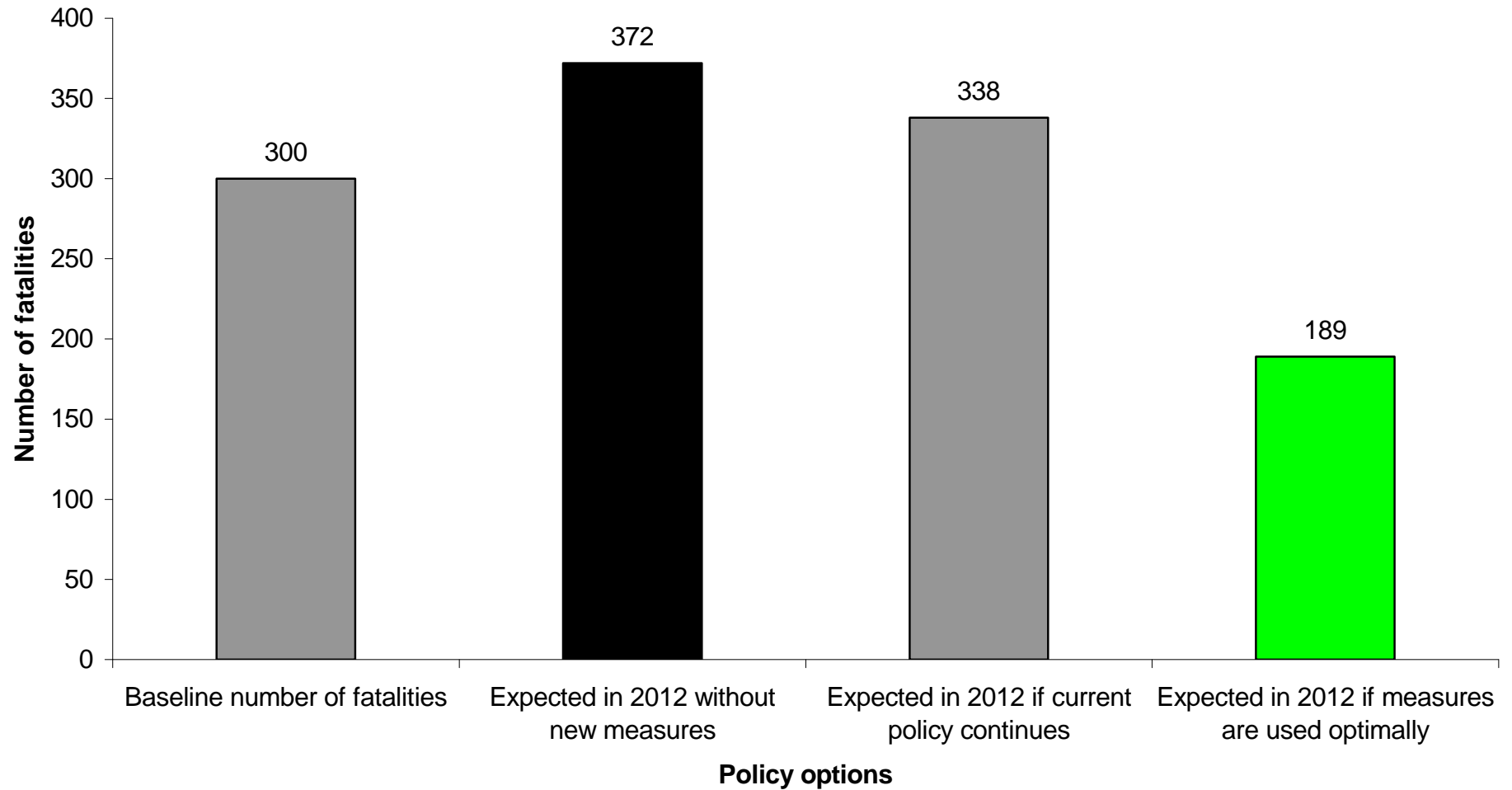
# A maximally efficient use of road safety measures

- Each road safety measure is used optimally
- Optimal use is to apply a measure up to the point at which marginal benefits (i. e. the extra benefits contributed by a small increase in the use of a measure) equal marginal costs of using the measure
- Optimal use of road safety measures will maximise social benefits and yield the largest surplus of benefits over costs
- Benefits include all relevant impacts of measures on safety, mobility and environmental quality

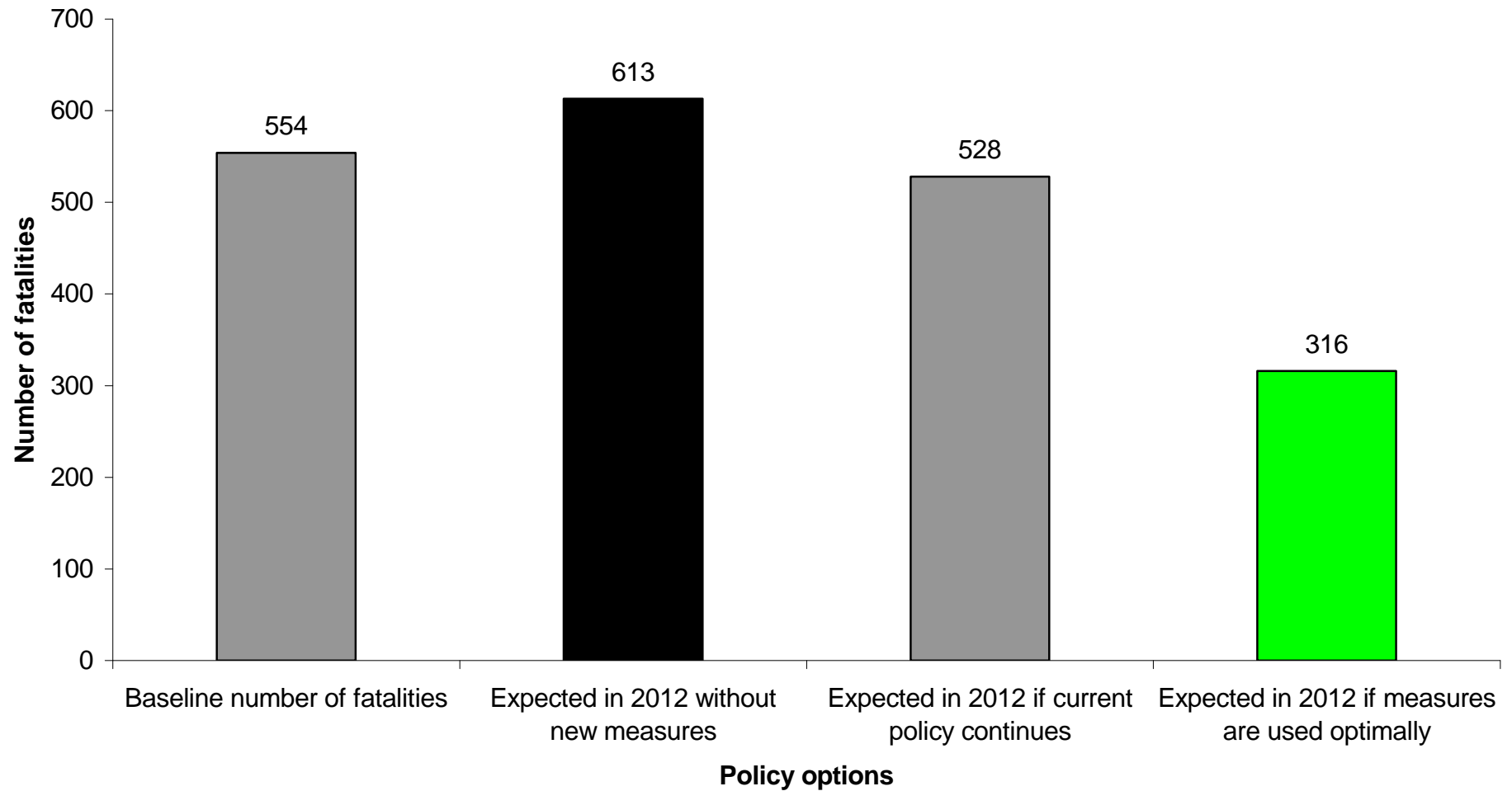
### Potential reduction of road accident fatalities by 1993 in Norway according to policy analysis in 1984



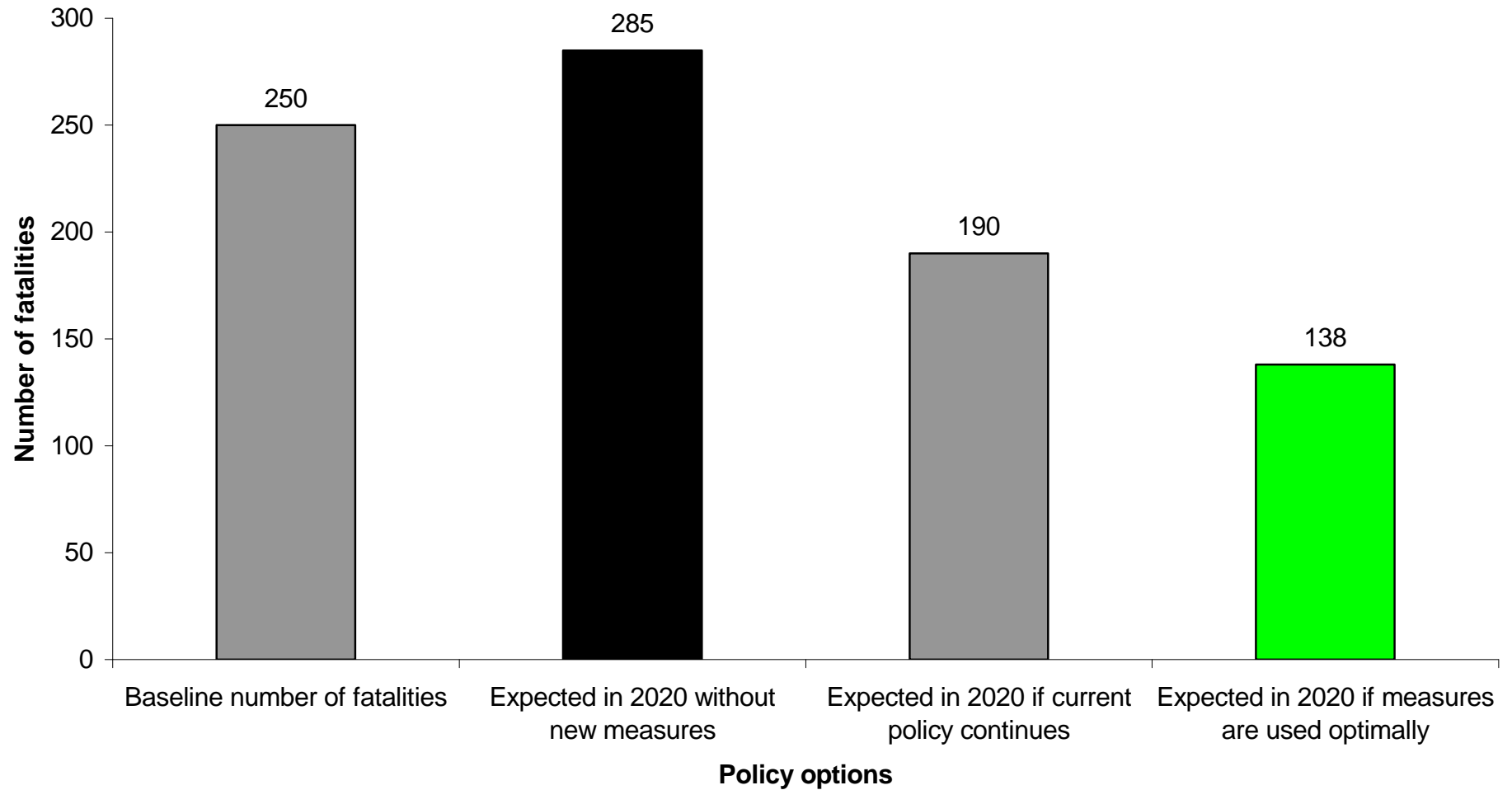
## Potential reduction of road accident fatalities in Norway by 2012 according to policy analysis in 1999



## Potential reduction of road accident fatalities in Sweden by 2012 according to policy analysis in 2000



**Potential reduction of road accident fatalities in Norway by 2020 according to policy analysis in 2007**



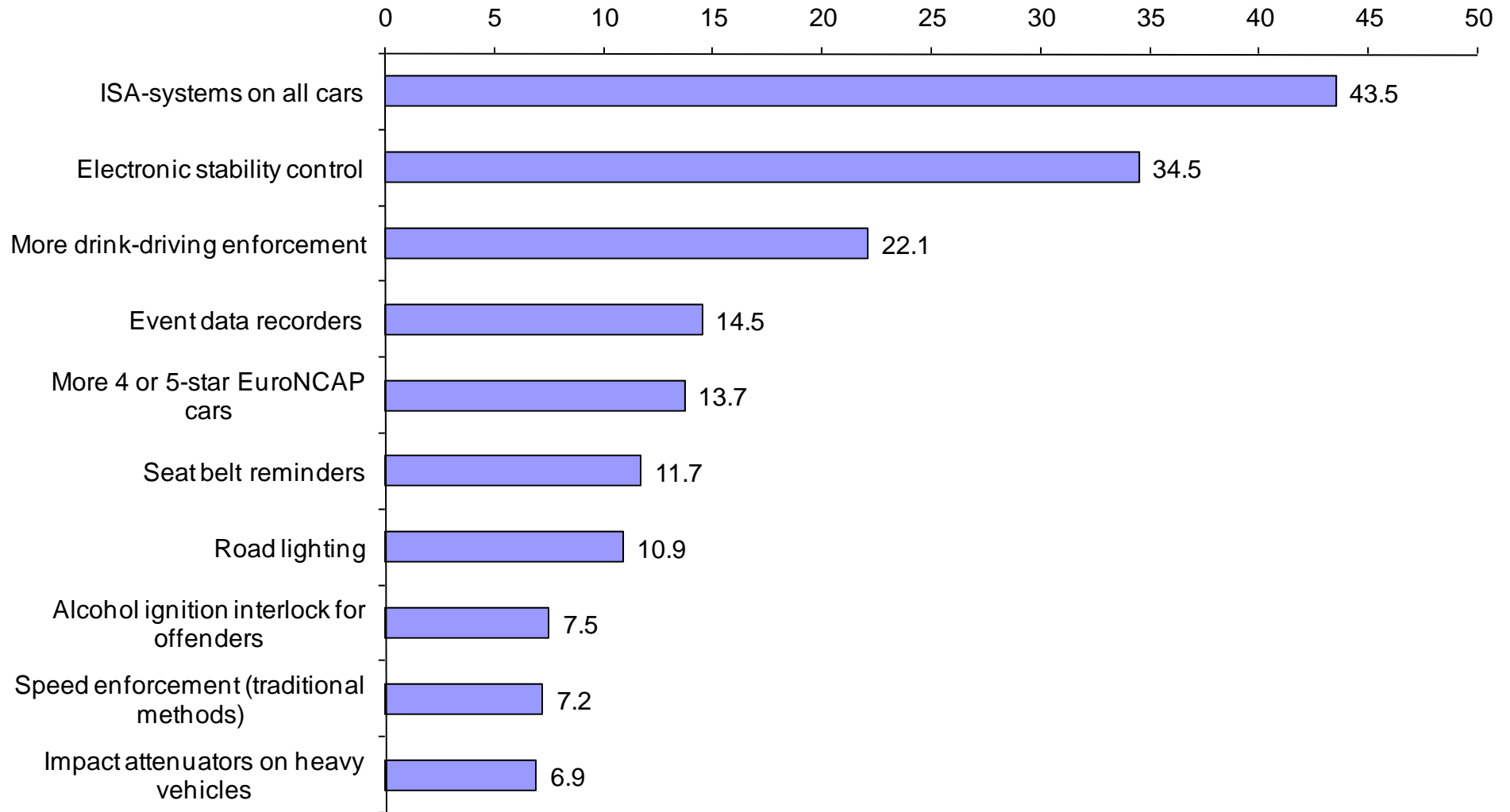


# Some preliminary observations

- Road safety can be greatly improved by using road safety measures optimally
- Current road safety policies do not use all road safety measures optimally
- The potential for reducing the number of fatalities does not appear to have been reduced over time
- Which are the road safety measures that can contribute the most to reducing fatalities and how realistic is it to apply these measures optimally?

### The ten most effective measures (effects cannot be added)

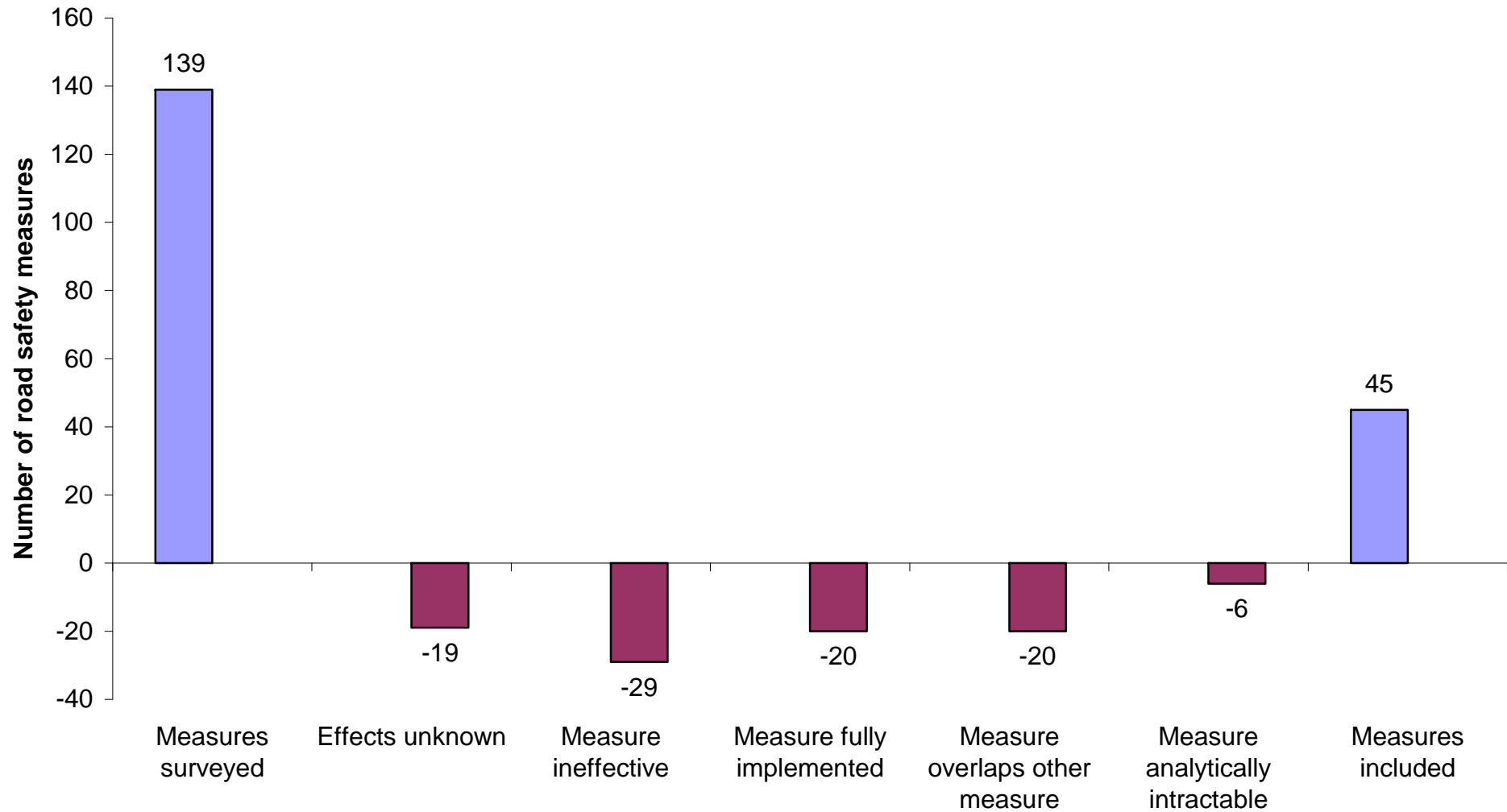
Reduction of the number of fatalities (in Norway)



# Some challenges in using road safety measures cost-effectively

- Cost-effectiveness is not known for all road safety measures – introducing a new measure cannot be based entirely on cost-effectiveness
- There can be good reasons for not basing priorities strictly on cost-effectiveness
  - Reducing risk for pedestrians and cyclists
  - Reducing the total number of road accident fatalities
- Some of the more cost-effective measures require international agreement to be broadly used – in particular vehicle safety features

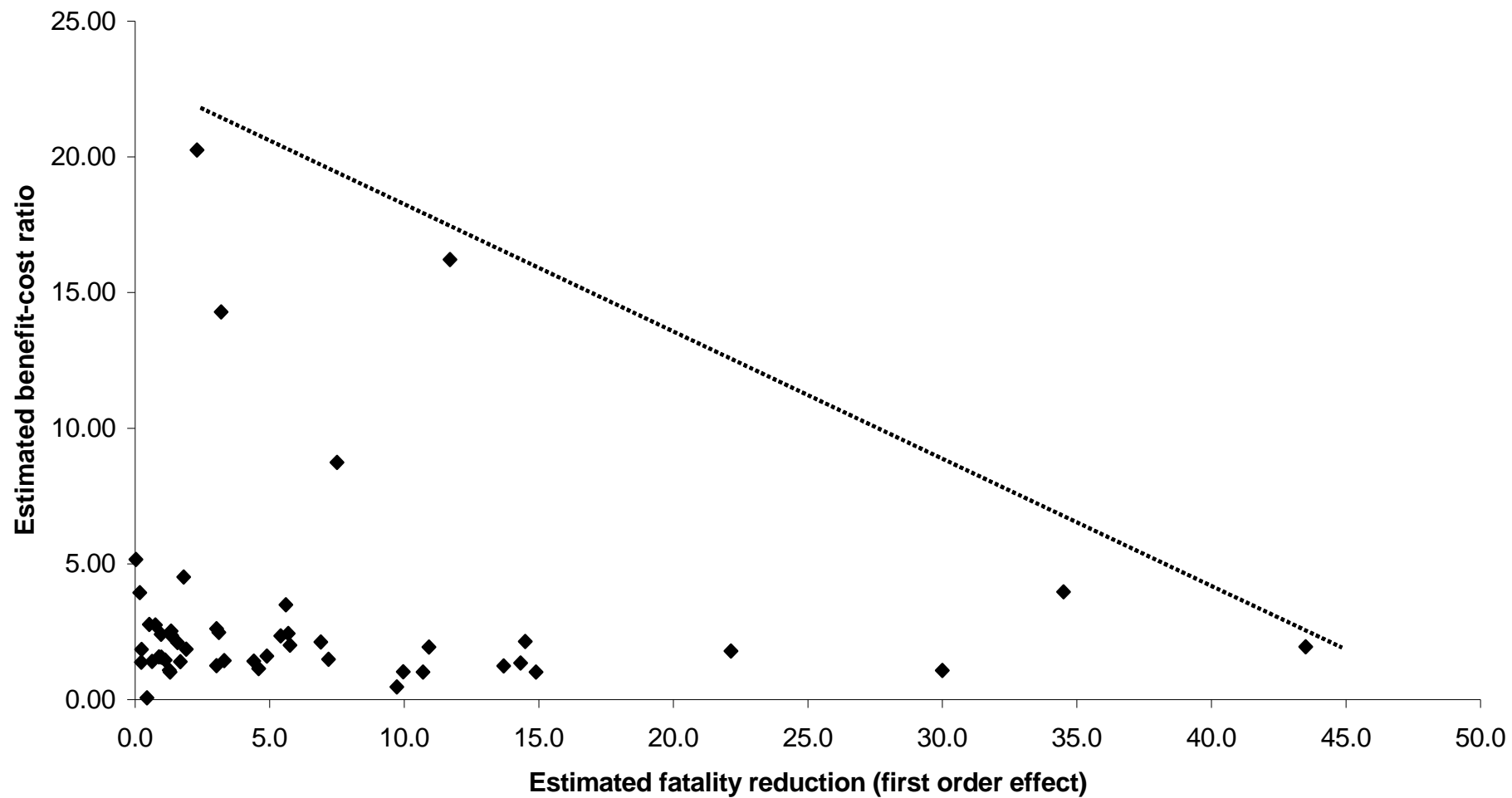
## Road safety impact assessment for Norway



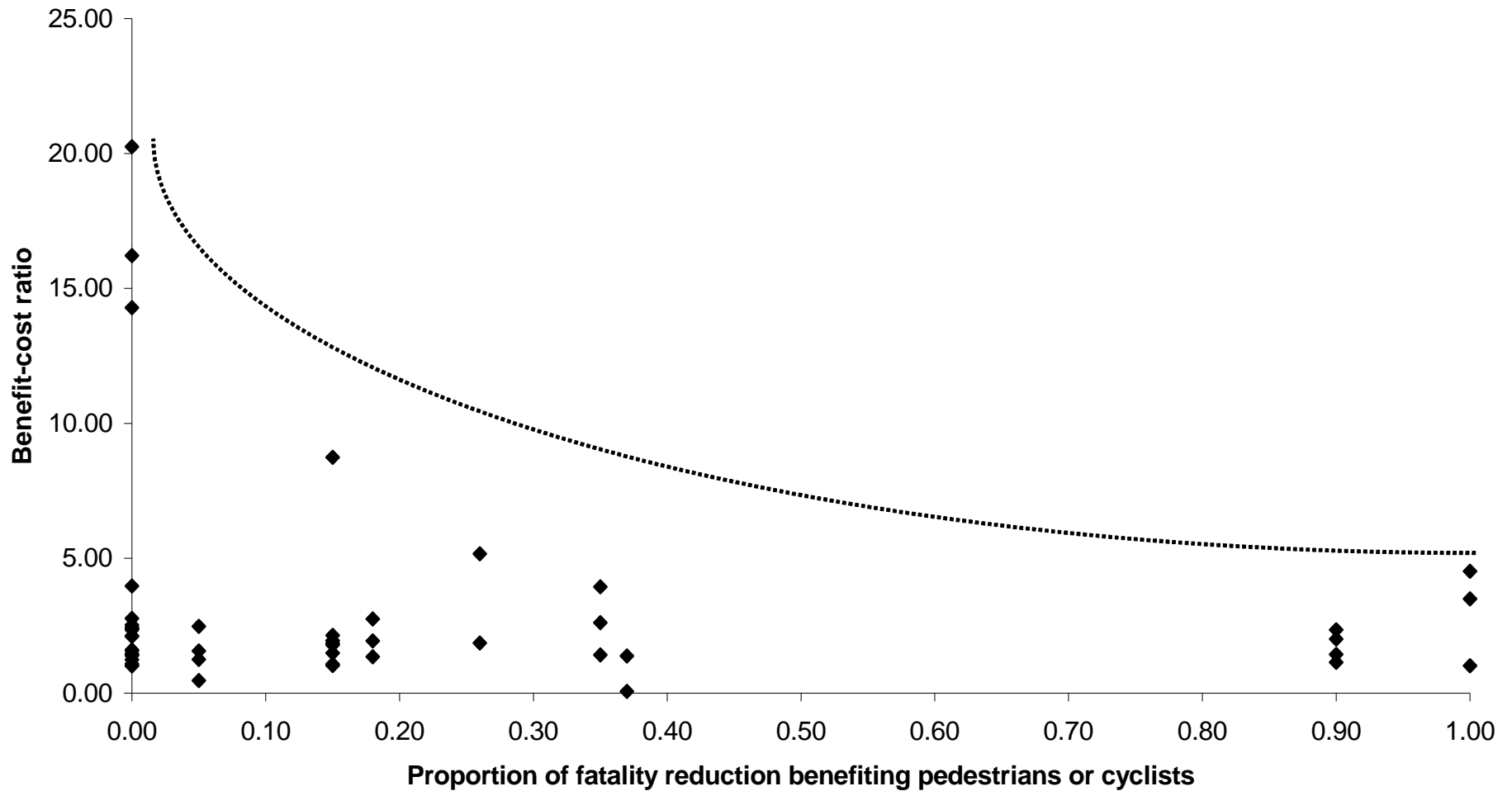
# How to deal with new measures

- New measures should only be introduced if there are reasons to believe that they would improve road safety
- Such reasons are:
  - The measure is known to favourably influence one or more risk factors that contribute to accidents or injuries
  - The measure is unlikely to lead to behavioural adaptation
  - New technology should perform more reliably than humans
- Examples:
  - ISA: likely to be effective
  - Fatigue monitoring: unreliable and likely to be compensated
  - Intelligent cruise control: drivers are very reliable, technology may not be better

### Relationship between estimated fatality reduction (first order effect) and benefit-cost-ratio



### Relationship between proportion of benefits for pedestrians and cyclists and benefit-cost-ratio

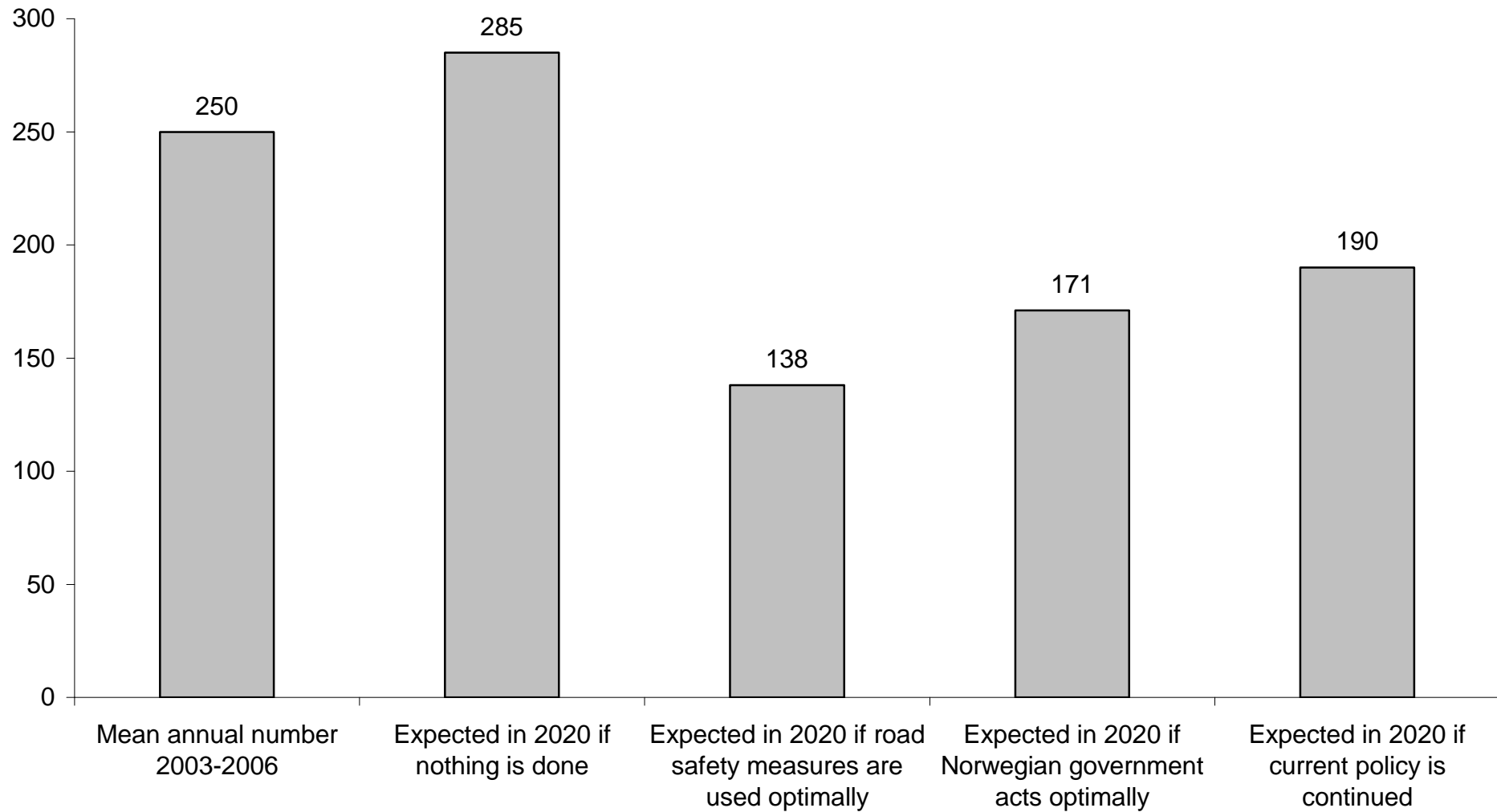


# International cooperation is needed

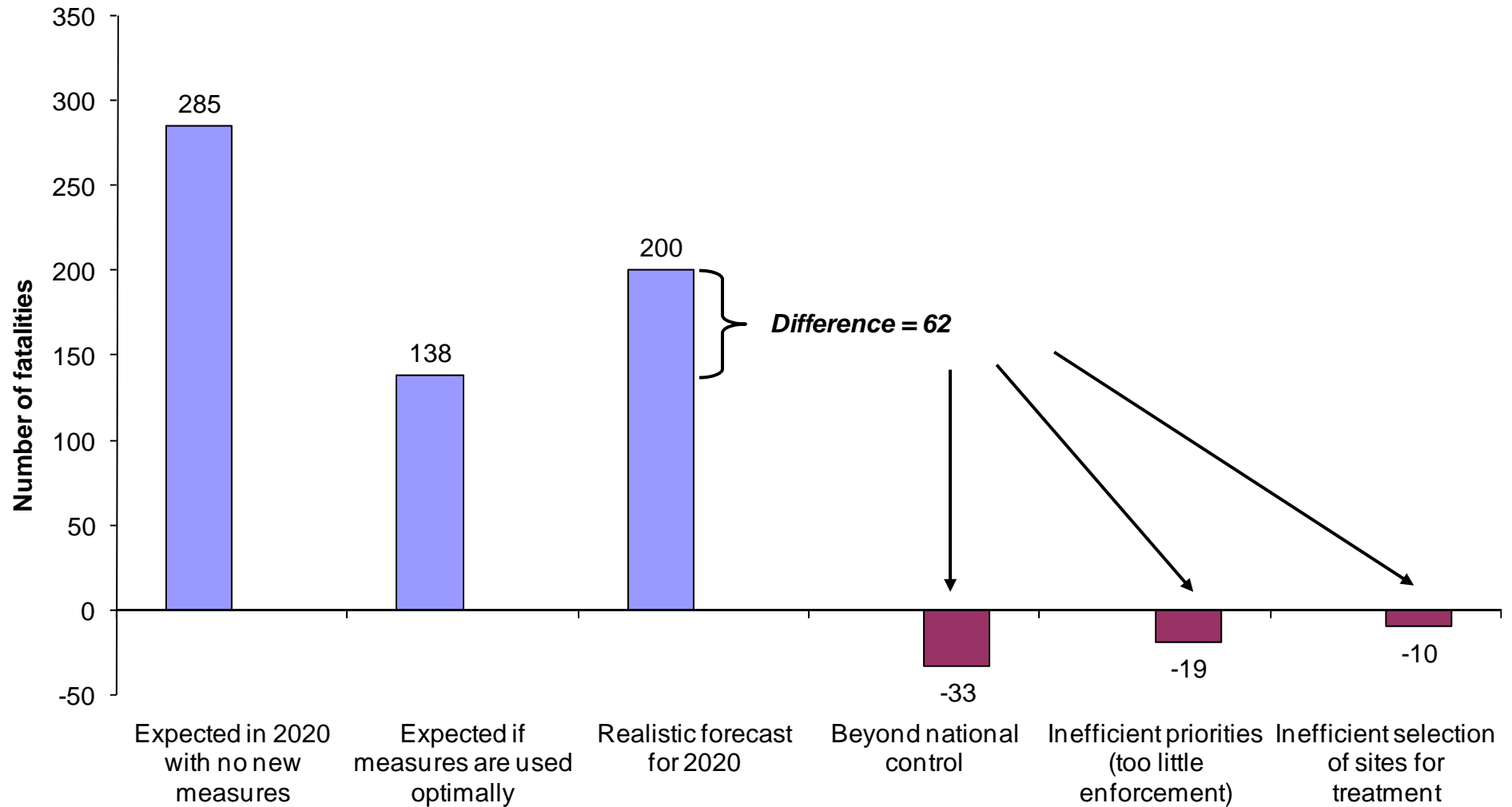
- An increasing proportion of the potential for improving road safety is attributable to vehicle safety features
- Some promising new safety features include:
  - ISA (intelligent speed adaptation)
  - Accident data recorder
  - Enhanced neck injury protection in rear impacts
  - Electronic stability control
- To make new safety features mandatory on all new cars, international agreement is needed, as the market for cars is global and safety standards should be the same in all countries



## Expected number of road accident fatalities in Norway in 2020



## Theoretical and realistic reduction of fatalities by 2020 in Norway



# Concluding remarks

- It is often argued that improving road safety is cost-effective – it gives good value for money
- This is true: a cost-effective use of road safety measures can greatly improve road safety
- Yet: road safety measures tend to be used inefficiently – and this is likely to continue
- Overcoming the barriers to a cost-effective use of road safety measures is quite difficult – in fact almost inconceivable
- Hence, road safety will continue to improve more slowly than is theoretically possible