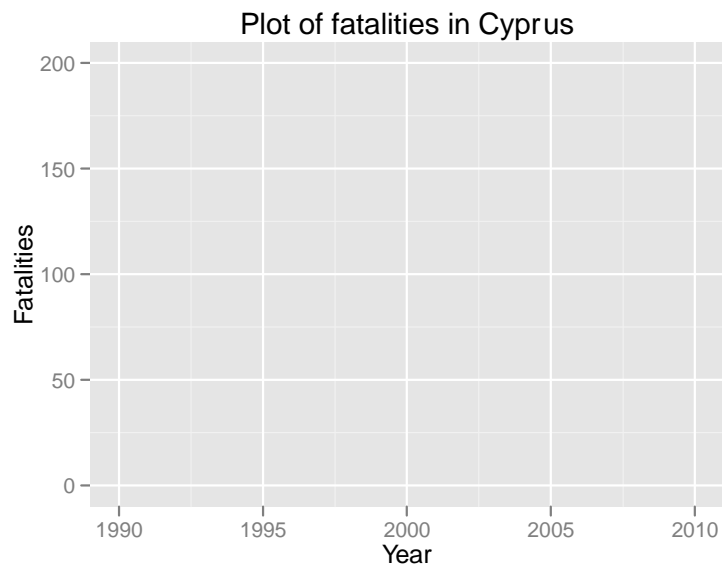


Road Safety Development

Cyprus

Fatalities

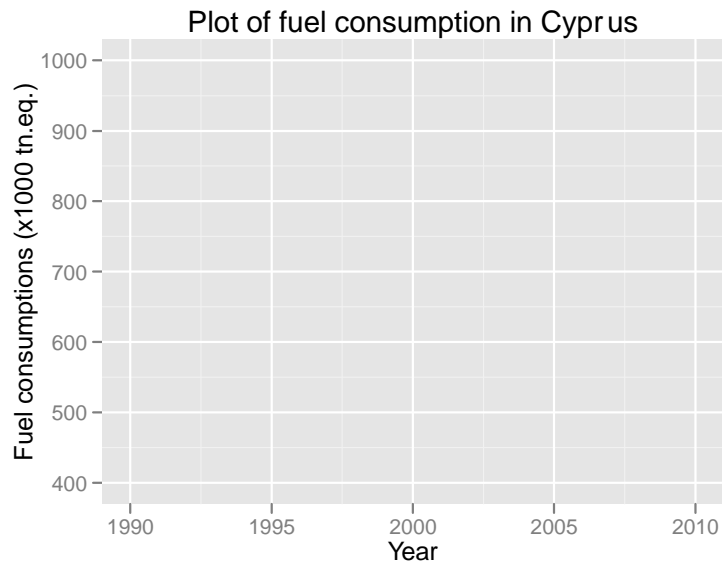


- The fatalities have dropped from almost 103 in 1991 to 60 in 2010. Fatalities were increasing by 3% in 1991, reached zero growth in 1993, and kept decreasing until they reached a rate of -7% in 2010.
- During the first years (1990s) there is some variability and no clear trend can be observed. There is a dip in the first half of the 2000s and a consistent drop after 2004. This could possibly be attributed to the accession of Cyprus to the EU (which took place that year).



Road Safety Development - Cyprus

Traffic Volume



- The number of fatalities depends strongly on the amount of traffic (exposure). To forecast the fatalities, the exposure needs to be forecasted first.
- The selected exposure measure is the fuel consumption (per 1000 ton. of oil equivalent) per annum, which are considered from 1991 until 2010. A fairly consistent increasing trend can be noticed until 2008, at which point –possibly due to the recession- fuel consumption started declining.
- Development:
 - o The fuel consumption increased from 460 thousand tons in 1991 to about 860 thousand in 2010.
 - o The increase did not take place at the same rate throughout this period. In the early seventies there was an increase of 8%, but since then the yearly increase continuously weakened, and in the most recent years it has practically halted.

Met opmaak: Niet Markeren

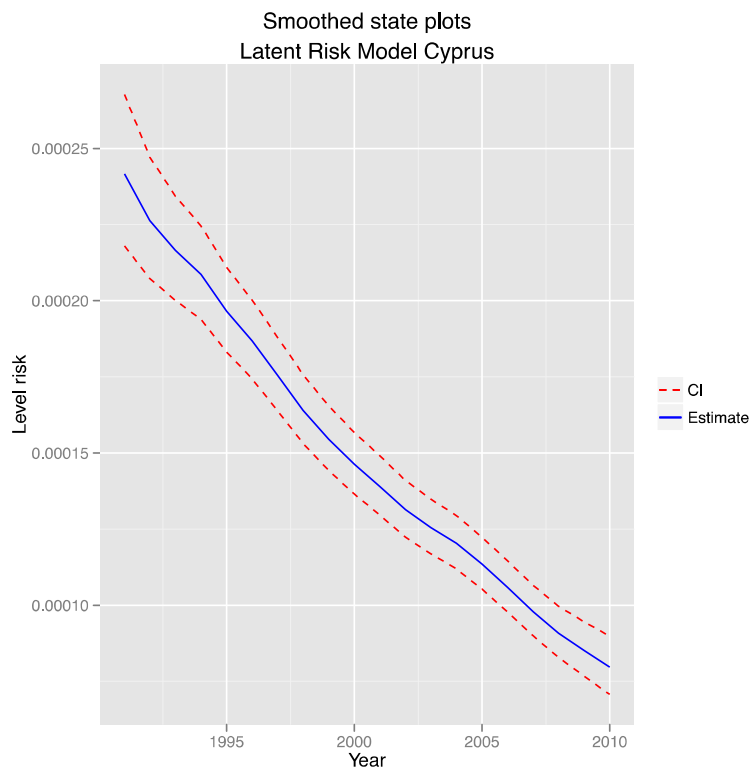


Road Safety Development - Cyprus

Fatality Risk

- The fatality risk is the number of fatalities per 1000 tons equivalent of oil consumption.
- Estimation model – technical definition:
 - o Latent Risk Model [3]
 - o Fixed level exposure, fixed slope & level risk
- CI: 68% confidence interval

Met opmaak: Niet Markeren



- The fatality risk has been reduced in Cyprus from more than 0.25 per thousand tn.eq. of oil consumed in the early 90s to about 0.08 in the most recent years.
- This amounts to a decrease of 4% - 6%.

Met opmaak: Niet Markeren

The fatality risk has been decreasing by about 4%-6% annually



Road Safety Development - Cyprus

Forecasts to 2020

- If road safety is improved at the same rate as previously and the past development of mobility continues, the following forecasts can be made for the number of fatalities in 2020:



If road-safety continues as observed up to 2010, the expected number of fatalities in 2020 is 37.

Forecast of road-traffic fatalities in Cyprus up to 2020

Year	Prediction	Lower CI	Upper CI
2011	65	55	77
2012	61	50	75
2013	58	45	73
2014	54	41	71
2015	51	36	70
2016	47	32	70
2017	44	28	70
2018	42	25	70
2019	39	22	70
2020	37	19	71

Disclaimer

- Statistical forecasting does not offer a definite prediction of what is *actually* going to happen in the future.
- The estimates are based on the "business as usual" assumption: no *principal* changes between past and future development.
- Even in these conditions future outcomes are uncertain. This uncertainty is represented in the confidence intervals (plotted in the red margins: 68%; printed in table: 95%).

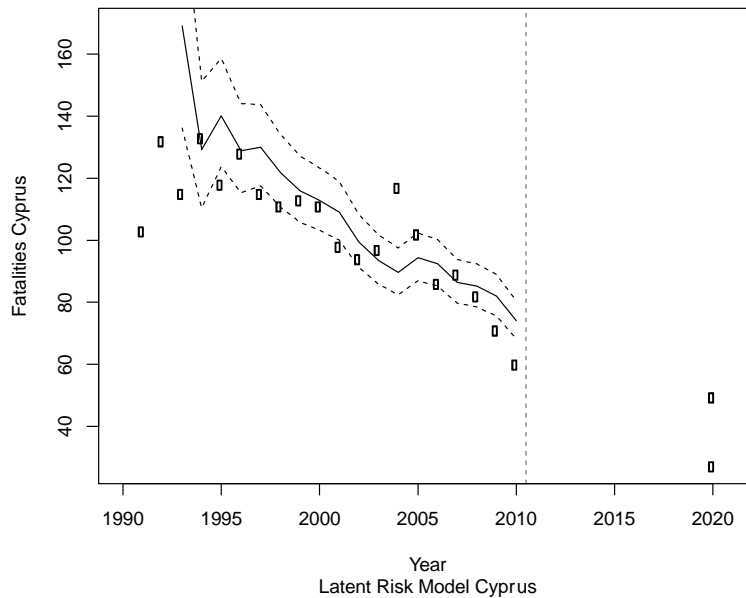


Road Safety Development - Cyprus

Scenarios

- The strong uncertainty about the development of the fatalities in Cyprus is for a good part due the development in traffic volume.
- To illustrate that, three point-estimates for fatalities in Cyprus for 2020 are plotted assuming three different scenarios for traffic volume (using fuel consumption as an indication).
- To illustrate that, three point-estimates for fatalities in Cyprus in 2020 are plotted assuming three different scenarios for traffic volume:
 - o Reference: continuation of development, i.e.: stagnation (forecast)
 - o Scenario 1: increase (forecast plus one standard deviation)
 - o Scenario 2: decrease (forecast minus one standard deviation)

Forecastplot



Scenarios for Traffic Volume

	<i>Fuel consumption (million tn.eq.)</i>	<i>Road traffic fatalities</i>
Situation 2010:	866	60
Prediction 2020 according to mobility scenarios:		
- Continuation of development (stagnation)	890	37
- Increase	1132	49
- Decrease	701	27



Road Safety Development - Cyprus

References

- [1] EC National Expert for road accident statistics and road safety performance indicators.
- [2] Dupont & Martensen (Eds.) 2012. Forecasting road traffic fatalities in European countries. Deliverable 4.4 of the EC FP7 project DaCoTA.
- [3] Bijleveld F., Commandeur J., Gould P., Koopman S. J. (2008). Model-based measurement of latent risk in time series with applications. Journal of the Royal Statistical Society, Series A, 2008.
- [4] Martensen & Dupont (Eds.) 2010. Forecasting road traffic fatalities in European countries: model and first results. Deliverable 4.2 of the EC FP7 project DaCoTA.
- [5] Commandeur, J. & Koopman, S.J. (2007). An Introduction to State Space Time Series Analysis. Oxford University Press.

