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How Lassarre 2001 fails to demonstrate a plausible dose-response relationship between the usage rate of motorcar daytime running lights, and the incidence of fatal accidents, as a result of a campaign in les Landes

A critical review of Lassarre 2001 'Évaluation de l'expérimentation des feux de croisement de jour dans les Landes' *[The evaluation of a daytime running light experiment in les Landes]*

[A paper prepared in collaboration between the Fédération Française des Motards en Colère and the British Motorcyclists Federation]

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A critical review of Lassarre 2001 'Évaluation de l'expérimentation des feux de croisement de jour dans les Landes' [*The evaluation of a daytime running light experiment in les Landes*]

Introduction: Lassarre 2001's own Abstract of his study findings

'Résumé

Une expérimentation sur l'allumage des feux de croisement de jour a été lancée dans les Landes en juin 1999 avec la diffusion de 100 000 dépliants et l'installation d'une quarantaine de panneaux recommandant aux automobilistes « roulez éclairé ». Cette opération pilotée par la préfecture est accompagnée d'un dispositif d'évaluation qui repose sur :

- Une enquête par questionnaire postale passée en décembre 1999 pour explorer les opinions des conducteurs landais sur la mesure,
- Deux enquêtes sur route en mars et juin 2000 pour estimer le pourcentage de véhicules circulant avec les codes de jour,
- Une évaluation de l'efficacité de la mesure sur le nombre d'accidents mortels et corporels impliquant au moins deux véhicules motorisés de jour par beau temps à l'aide d'un plan avant (3ans)/après (1 an) × expérimental (Landes)/témoin (5 départements limitrophes).

L'adhésion à l'opération mesurée par questionnaire est importante parmi les conducteurs landais avec 58 % déclarant allumer les feux de croisement de leur véhicule régulièrement, dont 12 % toujours. Elle est supportée par deux logiques fondées sur l'intérêt de la mesure pour être mieux vu sur la route chez les jeunes conducteurs et sur une justification plus large, comme mesure de sécurité pour les conducteurs âgés.

Le taux d'éclairage moyen sur le premier semestre 2000 est respectivement de 22 % sur le réseau à grande circulation et de 14,5 % pour le réseau des routes départementales secondaires. Ce taux a du être plus élevé le deuxième semestre 1999

L'opération « En plein jour, roulez éclairé » s'est avérée efficace pour réduire le nombre d'accidents impliquant au moins deux véhicules de jour par beau temps sur le réseau des routes à grande circulation du département avec 59 % des accidents mortels et 40 % des accidents graves et mortels évités. Ces deux réductions sont statistiquement significatives. L'efficacité, comme attendue par la théorie, est divisée par deux pour les accidents corporels avec 24 %. L'efficacité est nulle sur le réseau des « petites » routes départementales.

or [Present author's translation]:

'Abstract

An experiment into the lighting of dipped headlights in daytime was launched in les Landes in June 1999 with the distribution of 100,000 leaflets and the erection of some 40 signs recommending motorists to "Drive with your lights on". This operation directed by the Préfecture was accompanied by a scheme of evaluation that was based upon:

- A postal questionnaire survey conducted in December 1999 to explore the opinion of Landais drivers on the measure
- Two roadside surveys in March and June 2000 to estimate the percentage of vehicles travelling with dipped headlights in daytime,
- An evaluation of the effectiveness of the measure upon the number of fatal and injury accidents involving at least two motor vehicles in good weather in daytime by means of a plan before (3 years) / after (1 year) × experimental (Landes) / control (5 adjacent Départements).

The compliance of Landais drivers with the operation as measured by questionnaire was substantial with 58 % declaring that they switched on the dipped headlights of their vehicle regularly, out of whom 12 % declared always. It was supported by two rationales founded upon the advantage of the measure of being better seen on the road as regards young drivers and a broader justification as a safety measure for old drivers.

The average rate of use of lights during the first six months of 2000 was respectively 22 % on the major road network and 14.5 % on the secondary network of 'routes départementales' [Départemental roads]. This rate must have been higher during the last six months of 1999.

The campaign "Drive with your lights on in broad daylight" proved effective in reducing the number of accident involving at least two vehicles in good weather in daytime on the major road network of the Département with 59% of fatal accidents, and 40% of serious and fatal accidents prevented. These two reductions are statistically significant. The effectiveness, as theoretically expected, was halved for injury accidents with 24 %. The effectiveness was zero on the network of "little" routes départementales.'

A. The failure of Lassarre 2001's main analysis

Lassarre 2001 analysed the effect upon accidents of a campaign in favour of the use of motorcar daytime lights that took place in the Département of les Landes on the Atlantic coast of the South of France during the year from July 1999 to June 2000.

In the main analysis:

- Lassarre's experimental data comprised injury accidents in daytime in good weather involving at least two vehicles on open country roads, or roads through towns or villages of less than 5000 inhabitants, in les Landes

- Lassarre's control data comprised injury accidents of the same description in five Départements bordering les Landes
- Lassarre's measure of the exposure of vehicle drivers to daytime running lights comprised estimates of the percentage of vehicles using daytime running lights in les Landes in March 2000 and June 2000

Lassarre's method was:

- To compare the incidence of accidents in les Landes in the three years before the campaign with the incidence of accidents during the year of the campaign — and so arrive at an actual figure of the development of accidents in les Landes as a result of the campaign
- To compare the incidence of accidents in the five Départements bordering les Landes in the three years before the campaign with the incidence of accidents during the year of the campaign — and so arrive at an expected figure of the development of accidents in les Landes in the absence of the campaign
- To compare the actual figure of the development of accidents in les Landes as derived from the first comparison with the expected figure of the development of accidents in les Landes as derived from the second comparison.

Lassarre's first prediction was that actual figure of accidents in les Landes during the year of the campaign would be lower than the expected figure as derived from the development of accidents in the five Départements bordering les Landes.

Lassarre's second prediction was that the difference between the actual figure of accidents and the expected figure would be plausibly related to the percentage of vehicles using daytime running lights in les Landes during the year of the campaign.

In the event most of the analysis went wrong.

As above Lassarre 2001 only measured the percentage figure of vehicles using daytime running lights in les Landes during the campaign at the end of the campaign in March 2000 and June 2000.

For open country roads, or roads through towns or villages of less than 5000 inhabitants, in daytime in good weather the figure was 18.3%.

Lassarre 2001 presented and analysed his data as follows:

Table 8 : Number of accidents observed, expected and effectiveness according to road network and category of accident.

Injury	96–97	97–98	98–99	99–00	Expected	Effectiveness	Significance
Country roads	185	152	182	165	176,5	– 6,5%	NS
Country roads – 5 Départements	1072	1026	996	1052		(2%)	
Fatal + Serious	96–97	97–98	98–99	99–00	Expected	Effectiveness	Significance
Country roads	105	72	100	79	91,4	– 13,6 %	NS
Country roads – 5 Départements	449	438	398	424		(– 1,0%)	
Fatal	96–97	97–98	98–99	99–00	Expected	Effectiveness	Significance
Country roads	24	20	26	10	24,2	– 58,7 %	S
Country roads – 5 Départements	102	77	84	91		(3,8%)	

The ‘effectiveness’ of daytime running lights in reducing accidents in les Landes by comparison with the five Départements bordering les Landes during the year of the 1999/2000 campaign in favour of motorcar daytime running lights was only statistically significant for fatal accidents.

The figure of the effectiveness of daytime running light in reducing fatal accidents, at – 58.7%, was very high.

But Lassarre 2001 failed to support the figure by establishing a dose/response relationship — a figure of the effectiveness of – 58.7% was totally out of scale with a percentage figure of vehicles using daytime running lights as a result of the campaign of 18.3%, and so utterly implausible.

B. The failure of Lassarre 2001's subsidiary analysis

The failure of Lassarre 2001's subsidiary analysis would seem to have been so embarrassing to him that he does not publish the results of the analysis.

Lassarre gives as his excuse the volatility of small numbers of data.

Lassarre's subsidiary analysis was the same as his main analysis, save that his control data comprised single-vehicle injury accidents (excluding pedestrian accidents) in daytime in good weather in les Landes; as opposed to similar accidents involving at least two vehicles in the five Départements bordering les Landes.

The following table combines Lassarre 2001's presentation of the data for the subsidiary analysis, and the present author's own analysis (excepting a calculation of statistical significance) of the data:

Table 8 : Number of accidents observed, expected and effectiveness according to road network and category of accident.

Injury	96-97	97-98	98-99	99-00	Expected	Effectiveness	Significance
Country roads	185	152	182	165	180,4	- 8,5%	-
Single vehicle – Landes	85	94	103	98	.	(1,9%)	
Fatal + Serious	96-97	97-98	98-99	99-00	Expected	Effectiveness	Significance
Country roads	105	72	100	79	108,9	- 27,4 %	-
Single vehicle – Landes	53	.47	45	57		(15,3%)	
Fatal	96-97	97-98	98-99	99-00	Expected	Effectiveness	Significance
Country roads	24	20	26	10	34,2	- 70,7 %	-
Single vehicle – Landes	16	16	11	21		(43,2%)	

By comparison with a percentage figure of vehicles using lights as a result of the campaign in favour of motorcar daytime running lights in les Landes of 18.3%, a figure of the effectiveness of daytime running lights in reducing fatal accidents of - 70.7% is even more implausibly high than a figure of - 58.7%.

C. Lassarre 2001's failure to present the findings of the failed main analysis in his Abstract or Conclusions

Lassarre 2001 only describes and presents the findings of the main analysis in the main body of his paper.

D. Lassarre 2001's presentation instead of the more 'favourable' findings of an irregular analysis of incongruous data

In the Abstract and Conclusions of the paper Lassarre 2001 presents instead just the findings of an irregular analysis in which he incongruously adopts as his experimental data:

- Injury accidents in daytime in good weather involving at least two vehicles on major roads in les Landes, and as his control data:
- Injury accidents in daytime in good weather involving at least two vehicles on open country roads, or roads through towns or villages of less than 5000 inhabitants, in five Départements bordering les Landes.

Correspondingly in the Abstract and Conclusions, Lassarre's measure of the exposure of vehicle drivers to daytime running lights becomes the usage figure for major roads, namely 22.0%; not the 18.3% figure for open country roads, or roads through towns or villages of less than 5000 inhabitants.

At the same time in the Abstract and Conclusions, Lassarre focuses upon Fatal + Serious accidents; not Fatal accidents.

Lassarre 2001 conducted the irregular analysis as follows:

Table 8 : Number of accidents observed, expected and effectiveness according to road network and category of accident.

Injury	96–97	97–98	98–99	99–00	Expected	Effectiveness	Significance
Major roads	82	54	73	54	71,0	– 24,0 %	NS
Country roads – 5 Départements	1072	1026	996	1052		(2%)	
Fatal + Serious	96–97	97–98	98–99	99–00	Expected	Effectiveness	Significance
Major roads	49	33	50	26	43,6	– 40,3%	S
Country roads – 5 Départements	449	438	398	424		(– 1,0%)	
Fatal	96–97	97–98	98–99	99–00	Expected	Effectiveness	Significance
Major roads	15	12	15	6	14,5	– 58,7 %	S
Country roads – 5 Départements	102	77	84	91		(3,8%)	

He then conducted a sub-analysis, along the same lines, of Fatal + Serious accidents by the first six months, and the second six months, of the campaign in favour of motorcar daytime running lights in les Landes:

Table 9: Number of fatal or serious accidents observed, expected and effectiveness according to the six-month period for the major road network

2nd six months of 1999	96	97	98	99	Expected	Effectiveness	Significance
Major roads	33	18	27	13	26,4	– 50,8%	S
Country roads – 5 Départements	217	225	219	224		(1,7%)	
1st six months of 2000	97	98	99	00	Expected	Effectiveness	Significance
Major roads	16	15	23	13	17,31	– 24,9%	NS
Country roads – 5 Départements	232	213	179	200		(– 3,8%)	

The seeming attractions of the irregular analysis compared with the main analysis can be seen:

- 1) Lassarre achieves one more statistically significant finding of a reduction of accidents from daytime running lights
- 2) Lassarre elides the absence of any measure of the exposure of vehicle drivers to daytime running lights for the first six months of the campaign in les Landes, and achieves a plausible 'match' for the second six months of the campaign of a reduction of accidents from daytime running lights of – 24.9%, and a usage figure of 22.0%.

E. Lassarre 2001's failure to substantiate the reasons that he canvasses for the implausibly high findings of the irregular analysis of incongruous data — or by implication also for the implausibly high findings of the main and subsidiary analyses

Three problems of irregular analysis of incongruous data nevertheless remain:

First—in common with the main and subsidiary analyses—:

1) The implausibly high figure of a percentage reduction of fatal accidents from daytime running lights of – 58.7%;

second:

2) The implausibly high figure of a percentage reduction of fatal + serious accidents from daytime running lights of – 40.3%;

and third—whether or not the problem may be elided in presentation—:

3) The absence of a usage figure for the first six months of the campaign to match the finding of a reduction of fatal + serious accidents from daytime running lights of – 50.8%.

Lassarre 2001 proposes two possible explanations of the implausibly high size of the – 58.7%, – 40.3% and – 50.8% figures in the following passage:

‘Nous obtenons suite à l'expérimentation une estimation supérieure sur le réseau des routes à grande circulation aux estimations théoriques [*dérivées des prédictions de Koornstra et al 1997*]. Nous pensons que cela peut être dû à la configuration particulière du réseau landais qui rend plus efficace l'éclairage de jour, et aussi à des effets de percolation, au sens où 25 % de véhicules éclairés signalent en fait un plus grand pourcentage de véhicules qui peuvent être groupés en peloton, mais plus sûrement à un plus fort taux d'éclairage au deuxième semestre 1999 qu'au premier semestre 2000, seule période qui a fait l'objet du sondage sur route.’

‘We obtain as a result of the experiment an estimate for the major road network that is greater than the theoretical estimates [*from the predictions of Koornstra et al 1997*]. We think that that could be due to the particular configuration of the Landais network, which renders the daytime use of lights more effective, and also to the effects of percolation, in the sense that 25% of vehicles using lights imply in fact a higher percentage of vehicles that may be grouped together ‘en peloton’ [*ie bunched together, or ‘platooned’*], but more certainly to a higher usage rate of lights during the second six months of 1999 than during the first six months of 2000, the only period that was the subject of the roadside survey.’

But Lassarre does not seek to substantiate the explanations by further investigation.

F. Lassarre 2001's wrong reliance upon the logical fallacy 'Petitio Principii' in the arguments of the Conclusion of the paper

The logical fallacy 'Petitio Principii' is better known as the fallacy that is embodied in the false rhetorical device of 'begging the question', or the false form of reasoning that is given the name of 'circular argument'.

In the following passage from the Conclusions of Lassarre 2001:

'Elles [Ces deux réductions] sont obtenues avec un taux d'éclairage moyen sur le premier semestre 2000 respectivement de 22 % sur le réseau à grande circulation et de 14,5 % pour le réseau des routes départementales secondaires. **Ce taux a du être plus élevé le deuxième semestre 1999 car l'efficacité sur cette période est égale à deux fois celle du premier semestre 2000.'**

'They [These two reductions] are achieved with an average rate of use of lights during the first six months of 2000 of respectively 22% on the major road network and 14.5% on the network of secondary "routes départementales" [Départemental roads]. **This rate must have been higher for the second six months of 1999 because the effectiveness during this period is equal to twice that of the first six months of 2000.'**

Lassarre employs circular argument in order to pass over his failure to measure the rate of use of daytime running lights in the initial six months, as well as the final six months, of the campaign in les Landes.

The failure means that Lassarre lacks a percentage figure of the rate of vehicles using lights to compare either with the sub-analysis of his irregular analysis of incongruous data specifically for the second six months of 1999:

Table 9: Number of fatal or serious accidents observed, expected and effectiveness according to the six-month period for the major road network

2nd six months of 1999	96	97	98	99	Expected	Effectiveness	Significance
Major roads	33	18	27	13	26,4	- 50,8%	S
Country roads – 5 Départements	217	225	219	224		(1,7%)	

or for his analyses for the year of the campaign in les Landes as a whole.

So Lassarre is unable to complete a dose/response test of the plausibility of the analyses in question.

G. Lassarre 2001's wrong reliance upon the predictions of the flawed paper Koornstra et al 1997

Lassarre 2001 tests the plausibility of his findings for les Landes against the predictions for France as a whole that Koornstra et al 1997 derive

from the findings of their re-analysis of the data of the international motorcar daytime running light studies:

‘Le “modèle empirique” avec une efficacité intrinsèque de 22 % pour la France (Koornstra, 1997) prédit un réduction de 8,6 % des accidents corporels pour un taux de véhicules éclairés passant de 0 a 22 % sur RGC:

$$\text{Eff RGC} = 0,22 (1 - (1 - 0,22)^2) = 0,086$$

et de 17,2 %, le double, pour les accidents mortels. Nous obtenons suite à l'expérimentation une estimation supérieure sur le réseau des routes à grande circulation aux estimations théoriques.’

‘The “empirical model” with an intrinsic effectiveness of 22% for France (Koornstra, 1997) predicts a reduction of 8.6% of injury accidents for a rate of vehicles using lights increasing from 0% to 22% on RGC [major roads]:

$$\text{Eff RGC} = 0,22 (1 - (1 - 0,22)^2) = 0,086$$

and of 17.2%, double that, for fatal accidents. We obtain as a result of the experiment a higher estimate for the major road network than the theoretical estimates.’

and, as he records, finds his findings to be embarrassingly higher: a reduction of – 24.0% (not statistically significant) as opposed to – 8.6% for injury accidents; and – 58.7% as opposed to – 17.2% for fatal accidents.

The present author is able to pass over Lassarre 2001's embarrassment because, as is demonstrated by the critique of the conduct of Koornstra et al 1997 by Prower 2001 that is recited in full in the Appendix, by virtue of the wrong adoption by the authors of an inconsistent methodology, Koornstra et al 1997 is a fundamentally flawed and unreliable paper.

H. Lassarre 2001's failure to discuss the road safety implications of a 43.2% rise in fatal daytime single-vehicle accidents during the year of the campaign in favour of daytime running lights in les Landes

As can be seen from Table 8:

Table 8 : Number of accidents observed, expected and effectiveness according to road network and category of accident.

Fatal	96-97	97-98	98-99	99-00	Expected	Effectiveness	Significance
Country roads	24	20	26	10	34,2	– 70,7 %	–
Single vehicle – Landes	16	16	11	21		(43,2%)	

during the year of the campaign in favour of daytime running lights in les Landes the number of fatal daytime single-vehicle accidents rose by 90.9% compared with the previous year, or 46.5% compared with the average of the previous three years.

[The present author has been unable to 'back-calculate' the figure of '43.2%' from Table 8 from Lassarre 2001's data, and so determine how Lassarre derived the figure.]

Should the rise of fatal daytime single-vehicle accidents in question be related in some way to the campaign in favour of daytime running lights in les Landes, it would represent a substantial adverse side-effect of daytime running lights.

Yet Lassarre 2001 completely fails to canvass or discuss the reasons for the rise of fatal daytime single-vehicle accidents in his paper.

I. Lassarre 2001's failure to discuss the implications for the reliability of his findings of the volatility of his data

The volatility in particular of (1) small numbers of data, or in general of (2) road accident data is notorious.

A scrupulous analyst will only draw conclusions from such data with great circumspection.

In Lassarre 2001's main analysis, he analysed the following data:

Table 8 : Number of accidents observed, expected and effectiveness according to road network and category of accident.

Fatal	96-97	97-98		98-99		99-00	
Country roads	24	20	(- 16.7%)	26	(+30.0%)	10	(- 61.6%)
Country roads – 5 Départements	102	77	(- 24.5%)	84	(+ 9.1%)	91	(+ 8.3%)

In Lassarre's subsidiary analysis, he analysed the data:

Table 8 : Number of accidents observed, expected and effectiveness according to road network and category of accident.

Fatal	96-97	97-98		98-99		99-00	
Country roads	24	20	(- 16.7%)	26	(+ 30.0%)	10	(- 61.5%)
Single vehicle – Landes	16	16	(0 %)	11	(- 31.2%)	21	(+ 90.9%)

Or in Lassarre's irregular analysis of incongruous data, he relied upon the data:

Table 8 : Number of accidents observed, expected and effectiveness according to road network and category of accident.

Fatal + Serious	96-97	97-98		98-99		99-00	
Major roads	49	33	(- 32.7%)	50	(+ 51.5%)	26	(- 52.0%)
Country roads – 5 Départements	449	438	(- 2.4%)	398	(- 9.1%)	424	(+ 6.5%)

Fatal	96–97	97–98		98–99		99–00	
Major roads	15	12	(– 20.0%)	15	(+ 25.0%)	6	(– 60.0%)
Country roads – 5 Départements	102	77	(– 24.5%)	84	(+ 9.1%)	91	(+ 8.3%)

and:

Table 9: Number of fatal or serious accidents observed, expected and effectiveness according to the six-month period for the major road network

1st six months of 2000	97	98		99		00	
Major roads	16	15	(– 6.2%)	23	(+ 53.3%)	13	(– 43.5%)
Country roads – 5 Départements	232	213	(– 8.2%)	179	(– 16.0%)	200	(+ 11.7%)

As can be seen, apart from the control data, 'Table 8: Fatal + Serious: Country – 5 Départements', the small numbers, and year-to-year volatility of both the experimental and control data is pronounced.

Most dramatically, between 98–99 and 99–00, the control data, 'Table 8: Fatal: Single vehicle – Landes', rises from 11 accidents to 21 accidents, or + 90.9%.

But apart from the passing comment:

'On préfère estimer l'évolution en utilisant les statistiques d'accident sur les départements limitrophes plutôt que sur la catégorie d'accident à un seul véhicule, car elles sont moins sujettes aux aléas compte tenu de la taille importante des effectifs.'

'It is better to estimate the development by using the accident statistics for the adjacent Départements rather than the category of single-vehicle accidents because they are less subject to chance variations given the substantial size of the numbers involved.'

fails utterly to mention, let alone discuss, the influence upon the validity of the conclusions that he draws from the analysis of his data of the small numbers and pronounced volatility of the data in question.

J. Lassarre 2001's potentially misleading presentation of the findings of his questionnaire survey

Apart from the measurement of the percentage figure of vehicles using lights, and the analysis of accident data, another part of Lassarre's evaluation of the campaign in favour of daytime running lights in les Landes comprised a questionnaire survey of residents of les Landes.

In the Abstract—and Conclusions—of the paper, Lassarre 2001 states apropos the questionnaire:

'L'adhésion à l'opération mesurée par questionnaire est importante parmi les conducteurs landais avec 58 % déclarant allumer les feux de croisement de leur véhicule régulièrement, dont 12 % toujours.'

'The degree of compliance with the campaign as measured by questionnaire is substantial amongst the drivers of les Landes, with 58% declaring that they switch on the dipped headlights of their vehicle regularly, out of whom 12% declaring that they do so always.'

The lay reader may conclude from the statement that, in December 1999, namely the month of the questionnaire, the usage rate of daytime running lights in les Landes was likewise 58% — and so accept as plausible the 59% reduction of fatal accidents from daytime running lights that Lassarre 2001 also claims in the Abstract and Conclusions:

'L'opération "En plein jour, roulez éclairé" s'est avérée efficace pour réduire le nombre d'accidents impliquant au moins deux véhicules de jour par beau temps sur le réseau des routes à grande circulation du département avec 59 % des accidents mortels et 40 % des accidents graves et mortels évités.'

'The campaign "Drive with your lights on in broad daylight" has proved effective in reducing the number of accident involving at least two vehicles in good weather in daytime on the major road network of the Département, with 59% of fatal accidents, and 40% of serious and fatal accidents prevented.'

In fact, however, as Lassarre 2001 reports elsewhere in the paper, only 14.5% of recipients responded to the questionnaire¹.

Also 58% of respondents to the questionnaire did not, as Lassarre wrongly states, declare that they switched on the dipped headlights of their vehicle 'regularly'. Rather 46% of respondents declared that they did so 'often', and 12% declared that they did so 'always'.

It may be calculated that 12% of 14.5% is 1.7%.

So rather than suggesting that 58% of drivers in les Landes in December 1999 used daytime running lights in good weather in daytime, in fact the responses to Lassarre 2001's questionnaire suggested merely that at least 1.7% of drivers did so.

Conclusions

1. Lassarre 2001 reports the findings of:

- A controlled 'Before-and-after' study of the effect of motorcar daytime running lights upon daytime multi-vehicle accidents in good weather of a campaign in favour of the use of motorcar daytime

¹ And Lassarre 2001 does not report that he conducted a conducted a personal survey of a sample of non-responders to the questionnaire in order to establish that the replies of responders to the questionnaire were 'representative' of the replies that the non-responders would have made

running lights that was conducted in the Département of les Landes on the South Atlantic coast of France between June 1999 and June 2000

The 'controls'—ie types of accident that were used for comparative purposes—were alternatively (1) accidents in five neighbouring Départements, and (2) daytime single-vehicle accidents in good weather in les Landes

- A dose/response test of the plausibility of the findings of the controlled study that measured (1) the proportion of vehicles using daytime running lights in les Landes, and compared the proportion with (2) the reduction of accidents that was found by the controlled study.

The conduct of Lassarre 2001 was defective.

For the purposes of the dose/response test, Lassarre should have measured the increase of the proportion of vehicles using daytime running lights in les Landes over the same period as the period during which he analysed the development of accidents in les Landes — ie Lassarre should have measured the proportion of vehicles using daytime running lights in les Landes:

- 'Before' the commencement of the campaign in June 1999
- 'After' the commencement of the campaign during the initial six months of the campaign between June 1999 and December 1999
- 'After' the commencement of the campaign during the final six months of the campaign between January 2000 and June 2000.

In fact Lassarre only measured the proportion of vehicles using daytime running lights in les Landes 'after' the commencement of the campaign during the final six months of the campaign between January 2000 and June 2000, namely in March 2000 and June 2000.

Correspondingly Lassarre 2001 failed to perform a worthwhile test of the plausibility of the findings of his controlled 'Before-and-after' study of the effect of motorcar daytime running lights upon daytime multi-vehicle accidents in good weather of a campaign in favour of motorcar daytime running lights that was conducted in the Département of les Landes.

And the need of a test of the plausibility of Lassarre 2001's findings was very high: Lassarre found in particular a statistically significant reduction of 58.7% of fatal accidents **from all causes** on country roads in les Landes between June 1999 and June 2000 compared with a figure of just 18.3% of vehicles using lights in March 2000 and June 2000.

In lay terms, Lassarre 2001 can be said, by failing to have conducted full and adequate dose/response test, to have 'holed his own study below the waterline'.

Or in scientific terms, Lassarre 2001's findings are utterly implausible, and must be put down to the notorious volatility of small numbers generally, and small numbers of year-to-year road accident data in particular.

2. To compound the defective conduct of Lassarre 2001, Lassarre does not accept the failure of his study, and attempts to 'save' the study by a defective presentation:

- a. Lassarre fails to present his main findings, namely the findings for:
- Accidents on **country** roads in les Landes as controlled by accidents on **country** roads in five Départements adjacent to les Landes.

Instead Lassarre presents the more favourable—but incongruous, and so scientifically irregular— findings for:

- Accidents on **major** roads in les Landes as controlled by accidents on **country** roads in five Départements adjacent to les Landes,

b. Lassarre fails to present his subsidiary findings, namely the findings for:

- Accidents on **country** roads in les Landes as controlled by **single-vehicle accidents** in les Landes.

Instead as above Lassarre presents the more favourable findings for:

- Accidents on major roads in les Landes as controlled by accidents on country roads in five Départements adjacent to les Landes,

Seemingly the reason is that the findings include an even more implausibly high 70.7% reduction of fatal accidents on country roads than the 58.7% reduction when accidents are controlled by accidents on country roads in the five Départements adjacent to les Landes.

c. In the presentation of the Conclusions of his paper:

- Lassarre employs circular argument to supply baselessly for the missing figure of the proportion of vehicles using lights in the initial six months of the campaign in les Landes a 'higher figure' than the measured figure of 22.0% in the final six months of the campaign

[Given Lassarre's presentation, he recites 22.0%, namely the figure for major roads, not 18.3%, the figure for country roads that was given above]

- Lassarre suggestively recites, in the context of the missing figure, that 58% of drivers in les Landes declared in a questionnaire that they used daytime running lights in good

weather in daytime — whereas in fact only 1.7% of drivers who received the questionnaire actually responded that they always used daytime running lights in daytime.

But the attempt to save Lassarre 2001's study by the defective presentation fails, and the study remains 'holed below the waterline' by its defective conduct, and so doomed to sink irrecoverably beneath the waves.

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Wednesday 23 March 2005

References

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[The evaluation of a daytime running light experiment in les Landes]

Prower SM 2001 **'How Koornstra et al 1997 "The safety effects of daytime running lights" only achieved consistent findings in favour of daytime running lights from their re-analysis of the Swedish and Norwegian data by the adoption of an inconsistent methodology'** British Motorcyclists Federation

Appendix

How Koornstra et al 1997 'The safety effects of daytime running lights' only achieved consistent findings in favour of daytime running lights from their re-analysis of the Swedish and Norwegian data by the adoption of an inconsistent methodology

How Koornstra et al 1997 'The safety effects of daytime running lights' only achieved consistent findings in favour of daytime running lights from their re-analysis of the Swedish and Norwegian data by the adoption of an inconsistent methodology

1. Authors state in the summary and conclusions of the paper that the data of the 24 existing studies of motorcar (or all-vehicle) daytime running lights has been re-analysed on a 'comparably defined' basis:

'In this study all existing (24) independent DRL-evaluations have been reviewed and/or reanalysed in order to obtain unbiased, and comparably defined, intrinsic DRL-safety-effects while estimating statistical uncertainties in an optimal way.'

[Summary, conclusions and recommendations p4]

2. Authors state in the introduction to the main body of the paper that they will 'if needed and possible' apply an 'optimal methodology' (which they go on to describe) in the re-analysis of the data of the existing studies 'in order to arrive at ... comparable estimates':

'In this chapter an optimal methodology and analysis for evaluation of DRL-effects is described, which then in the next chapter is applied (if needed and possible) for a re-analysis of the accident data from several DRL-studies in order to arrive at optimal and comparable estimates of the DRL-effects in each DRL-evaluation.'

[Chapter 3. Methodological aspects of DRL-evaluations p50]

3. By way of re-analysis of the Swedish all-vehicle data, the authors conduct a separate analysis of summer and winter DRL-effects (which yields a finding in favour of DRL-use):

'The nearly significant difference between the intrinsic DRL-effects for the selected summer and winter periods and the different DRL-increases define two genuinely different raw DRL-effects, which should not be represented by one single raw DRL-effect for the whole year.'

*[Chapter 4. Annotated review and re-analyses of DRL-evaluations:
4.4 DRL-evaluation in Sweden p101]*

4. Authors present the result of their re-analysis of the Swedish data as the finding of the separate analysis of summer and winter DRL-effects:

'In conclusion the selected summer and winter periods prove that the DRL-effects for Sweden are significant, despite the critical comments by several authors who have concluded that a significant Swedish DRL-effect can not be demonstrated.'

[4.4 DRL-evaluation in Sweden p101]

5. By way of re-analysis of the Norwegian all-vehicle (excepting motorcycle) data, the authors again conduct a separate analysis of summer and winter DRL-effects.

But, unlike for Sweden, 'in contrast to expectation' the analysis yields a lower winter than summer finding:

'This most probable winter DRL-effect of 35.7% is significant (one-sided t-test $p=.01$), but in contrast to the expectation it is just significantly lower DRL-effect than the summer DRL-effect (one-sided t-test, $p=.05$) and also its parameter variance is significantly smaller (F-test, $p=.03$).'

*[Chapter 4. Annotated review and re-analyses of DRL-evaluations:
4.5 DRL-evaluations in Norway p112]*

6. Authors abandon the separate analysis of summer and winter DRL-effects for Norway.

Instead they present the result of their re-analysis of the Norwegian data as the finding of a whole year analysis of the average of summer and winter DRL-effects (which is now, like for Sweden, a finding in favour of DRL-use):

'Because of the significant differences between the summer and winter DRL-effects and their variances, one must not estimate a DRL-effect by an analysis of annual totals, but by an average of the summer and winter DRL-effects. This average DRL-effect percentages yields a whole year DRL-effect on casualties in MD-accidents between vehicles without rear-end accidents of:

[Algebraic presentation of finding omitted].

It amounts to a whole year DRL-effect on casualties in MD-accidents between vehicles without rear-end accidents of 48.5% for Norway.'

[4.5 DRL-evaluations in Norway p112]

7. By the change of methodology from a separate analysis of the summer and winter Swedish data to a whole year analysis of the Norwegian data—ie from 'disaggregating' to 'aggregating' annual data—the authors wrongly belie:

- The statement that they made in Chapter 3 that they would if needed and possible apply a methodology that was intended to achieve 'comparable estimates of the DRL-effects in each DRL-evaluation'.
- The statement in their Summary and conclusions that the data of the 24 existing studies had been re-analysed on a 'comparably defined' basis.

Koornstra et al 1997 have in fact adopted an inconsistent methodology for their re-analysis of the Swedish and Norwegian data. It is only thereby that they have achieved the consistent findings from the data that they rely upon in favour of daytime running lights in their paper.

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Thursday 2 August 2001