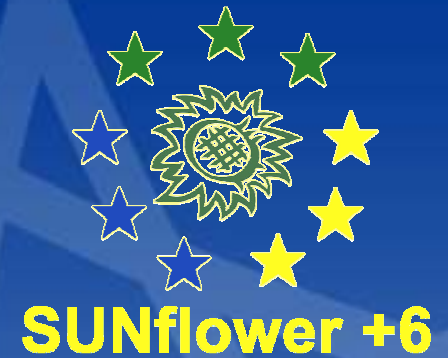




SafetyNet – SUNflower workshop
"Setting the stage for the
European Road Safety Observatory"
Amsterdam, 1st June 2007



Powered two-wheelers road safety

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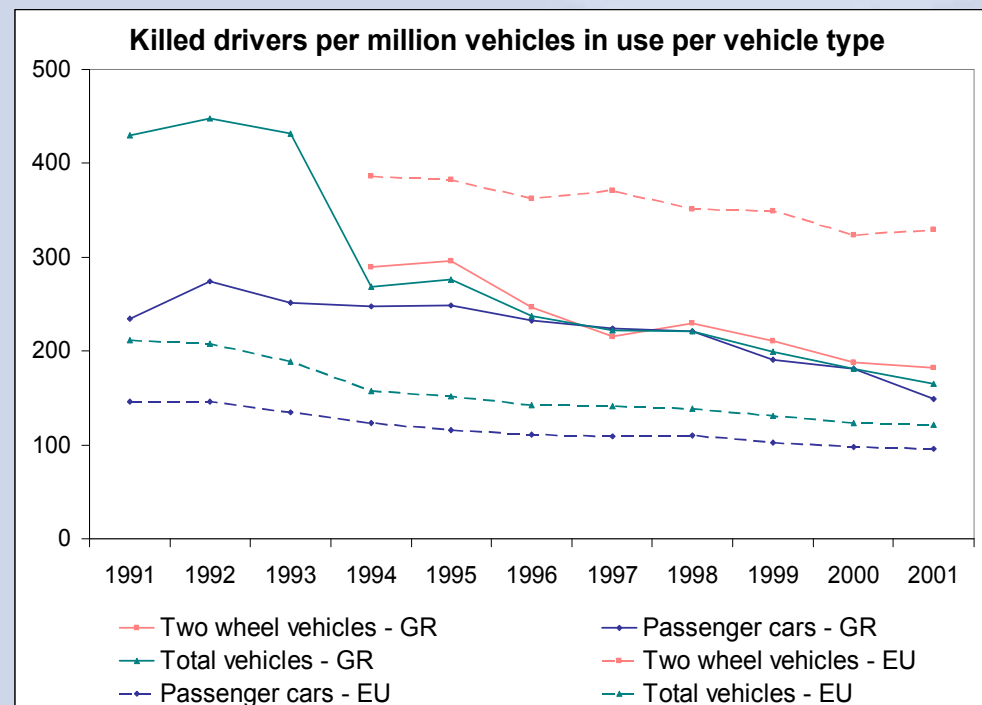


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<http://www.erso.eu>

POWERED TWO-WHEELERS SAFETY

- Relatively small contribution to mobility improvement contrary to the striking amount of accidents in which powered two-wheelers are involved.



Source: NTUA 2005

TWO-WHEELER RISK TRENDS

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
BE	187	174	193	199	198	184	210	226	169	153
DK	63	49	46	60	67	71	55	62	68	69
EL	628	541	506	569	561	496	503	396	363	434
ES	865	844	899	928	902	866	831	784	758	760
FR	1.164	1.170	1.250	1.279	1.281	1.227	1.356	1.298	1.126	1.205
IE	57	58	68	37	43	40	50	44	55	-
IT	1.187	1.192	1.221	1.191	1.180	1.279	1.315	1.289	1.441	1.458
LU	4	6	3	7	5	8	6	0	-	-
NL	208	198	180	165	182	196	154	191	189	-
AT	152	131	169	120	151	156	144	135	156	142
PT	793	733	680	556	506	437	413	369	370	302
FI	33	33	24	25	21	19	23	29	35	36
SE	41	54	49	52	48	49	47	49	56	74
UK	454	447	525	509	556	612	594	628	715	607
EU-14	5.835	5.630	5.814	5.697	5.701	5.640	5.701	5.500	5.501 ²	5.484 ¹
Yearly change	-	-3,5%	3,3%	-2,0%	0,1%	-1,1%	1,1%	-3,5%	0,0%	-0,3%

Source: EC – CARE Database

Powered two wheeler fatalities made up more than 20% of the total number of road accident fatalities in 2004.

TWO-WHEELER ACCIDENTS IN EUROPE

- In 2004, 5.484 occupants of motorcycles and mopeds were killed in road accidents in 14 EU countries.
- A reduction of 6% in powered two-wheeler riders' fatalities is noted during the decade 1995-2004 for the EU-14 countries.
- Between 1995 and 2004 the mortality rate (fatalities per million inhabitants) of powered two-wheeler users declined by 15% (from 20,1 in 1995 to 17,0 in 2004), compared with a 35% decrease (from 69,1 to 47,8) for car occupants.
- Moreover, the road accident risk concerning powered two wheelers (two wheeler fatalities per respective vehicle fleet) tends to decrease during the last years, throughout the European Union.



TWO-WHEELERS RISK PARAMETERS

Important reasons why powered two-wheeler riders have a higher accident risk are:

- the riding style (too fast for some motor drivers)
- poor visibility and recognisability by other road users
- high degree of vulnerability due to lack of protection

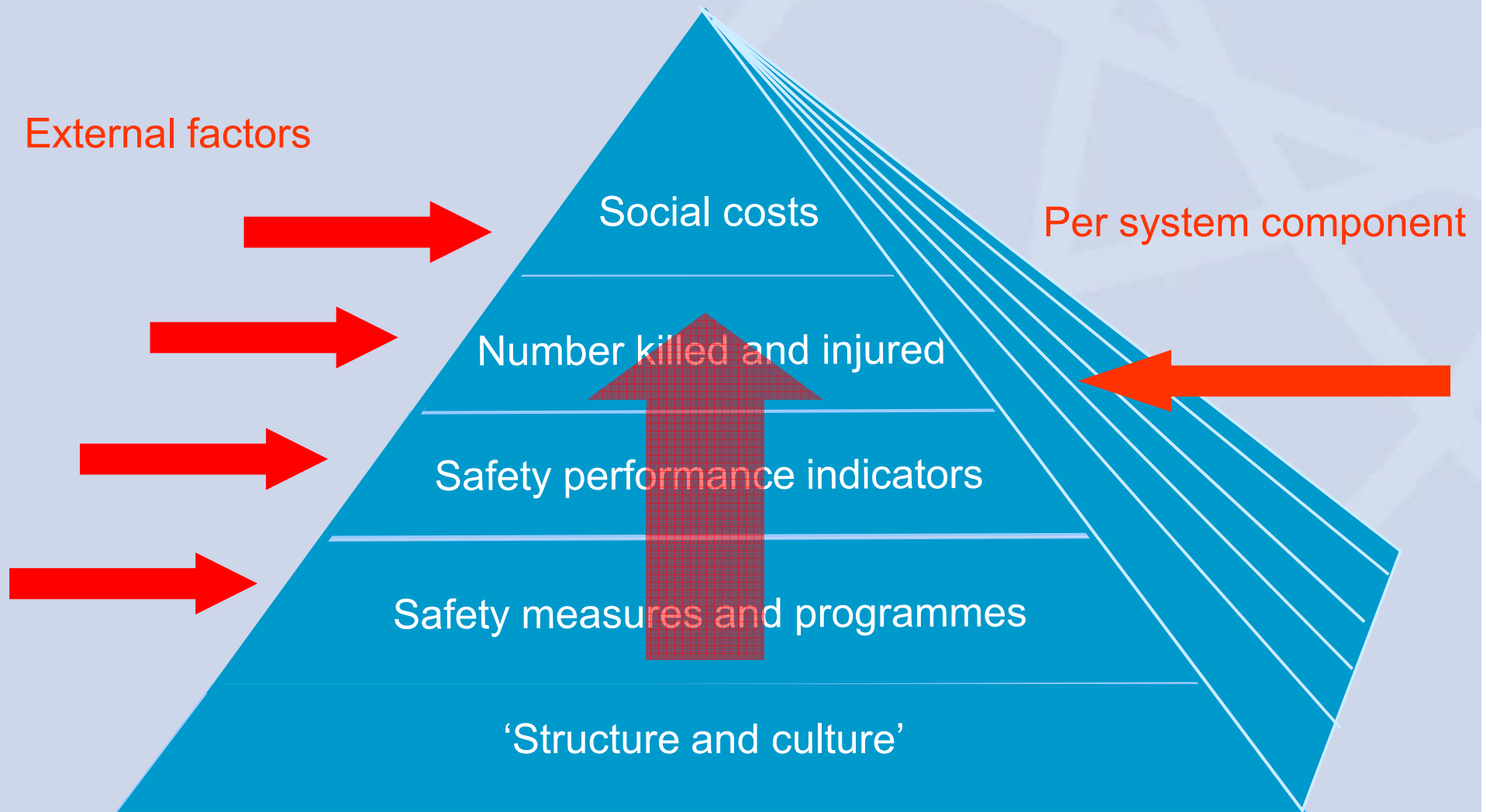


Also, in general, the powered two-wheeler rider:

- often fails to modify his speed to accommodate current conditions
- fails to recognise dangerous situations sufficiently
- is unaware of his own limitations and those of his motorcycle
- gives insufficient consideration to the perception capabilities of other road users
- lacks the skills needed in an emergency situation
- is insufficiently aware of his own vulnerability in the event of a collision



POWERED TWO-WHEELERS AND THE SUNFLOWER+6 FOOTPRINT



June 1, 2007

SafetyNet-SUNflower workshop

STRUCTURE AND CULTURE



- Road safety programs (with special provision for powered two-wheeler riders)
- Road safety authorities (with special provision for powered two-wheeler riders)
- User motivation for riding powered two-wheelers
- Conditions for riding powered two-wheelers
- Attitudes towards risk taking
- Climate



STRUCTURE AND CULTURE



Available

- Road safety programs with special provision for powered two-wheelers (partly available)
- Conditions for riding two-wheelers
- Climate

Missing

- Road safety authorities (special provision for powered two-wheelers)
- User motivation for riding powered two-wheelers
- Attitudes towards risk taking

SAFETY MEASURES AND PROGRAMS



- Powered two wheeler driving lessons/compulsory training
- Legal access age
- Provisional driving licenses (according to driving experience)
- Helmet wearing law
- Compulsory periodical technical inspections
- Enforcement/penalty levels
- Quality of road design standards with respect to powered two-wheeler specifications (visibility, obstacle free, good carriageway conditions)
- Awareness raising campaigns related to powered two-wheeler riders
- Specific traffic regulation for powered two-wheelers
- Periodic revisions of driving licensing for powered two-wheeler drivers
- Systematic recording powered two-wheeler violations (implementation of 'point system')



SAFETY MEASURES AND PROGRAMS



Available

- Powered two-wheeler users driving lessons/compulsory training
- Provisional driving licenses, according to driving experience (partly available)
- Legal access age
- Helmet wearing law
- Compulsory periodical technical inspections
- Enforcement/penalty levels
- Awareness raising campaigns related to powered two-wheeler riders
- Systematic recording powered two-wheeler violations (implementation of 'point system')

Missing

- Quality of road design standards (not always)
 - Specific traffic regulation for two-wheelers
- Periodic revisions of driving license for two-wheeler drivers

SAFETY PERFORMANCE INDICATORS



- Helmet/protective clothing wearing rate
- Alcohol and drugs related powered two-wheeler accidents
- Fatigue related powered two-wheeler accidents
- Speed related powered two-wheeler accidents
- Powered two-wheeler active safety systems (ABS etc)
- Degree of compliance with road design quality standards, with respect to powered two-wheelers
- Powered two-wheeler distribution in the vehicle fleet (by type and engine size)
- Comparisons to other modes of transport
- Data on PTW riders violations
- Data on technical inspection of powered two wheelers

SAFETY PERFORMANCE INDICATORS



Available

- Helmet wearing rate (partly available)
- PTW distribution in the vehicle fleet by type and engine size (partly available)
- Driving experience

Missing

- PTW riders under the influence of alcohol and drugs
- PTW speeding
- PTW riders under the influence of fatigue
- PTW active safety systems (ABS etc)
- Comparisons to other modes of transport
- Protective clothing wearing rate
- Data on technical inspection of powered two wheelers
- Degree of compliance with road design quality standards, with respect to PTWs
- Data on PTW riders violations

FINAL OUTCOMES



- Number of killed powered two-wheeler riders
- Number of injured powered two-wheeler riders by injury severity type
- Powered two-wheeler riders' casualties by 1.000.000 inhabitants
- Powered two-wheeler riders' casualties by 1.000 veh-kms
- Reduction in powered two-wheeler accidents in relation to the total accident reduction
- Number of powered two-wheeler riders wearing helmet/safety equipment
- Relative rate for fatality proportions in PTW occupants by age group



FINAL OUTCOMES



Available

- Number of killed powered two-wheeler riders
- Number of injured powered two-wheeler riders by injury severity type
- Reduction in powered two-wheeler accidents in relation to the total accident reduction
- PTW riders' casualties by 1.000 veh-kms (partly available)
- PTW occupants casualties by 1.000.000 inhabitants
- Relative rate for fatality proportions in powered two-wheeler riders by age group

Missing

- Number of PTW casualties wearing helmet / safety equipment

SOCIAL COSTS



- Costs due to powered two-wheeler fatal accidents
- Costs due to powered two-wheeler non-fatal accidents
- Costs related to material-damage-only powered two-wheeler accidents
- Harmonised Value of Statistical Life

SOCIAL COSTS



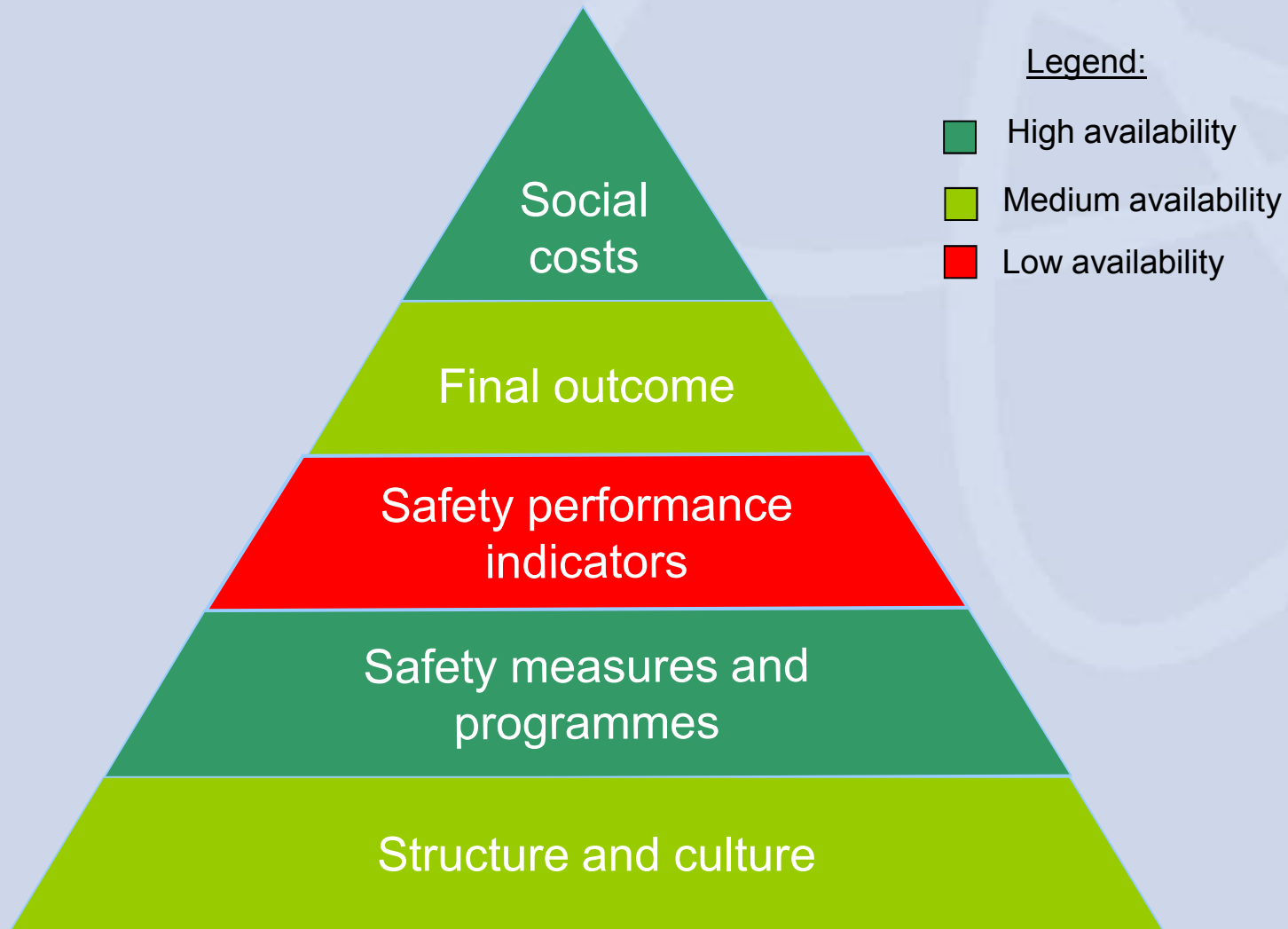
Available

- Costs due to powered two-wheeler fatal accidents
- Costs due to powered two-wheeler non-fatal accidents
- Costs related to material-damage-only powered two-wheeler accidents (partly available)

Missing

- Harmonised Value of Statistical Life

POWERED TWO-WHEELER PYRAMID



June 1, 2007

SafetyNet-SUNflower workshop

COUNTRY EXAMPLE: GREECE



STRUCTURE AND CULTURE

- Road safety authorities with special provision for PTW: **Not available**
- Road safety programs with special provision for PTW: **Not available**
- User motivation for riding PTW: **Not available**
- Conditions for riding PTW: **Not available**
- Attitudes towards risk taking: **Not known**
- Climate: **Favorable (mostly sunny and dry) during 3/4 of the year**
- Carriageway conditions: **Not good (in general)**
- PTW traffic volume: **Not available**

COUNTRY EXAMPLE: GREECE

SAFETY MEASURES AND PROGRAMS

- PTW users driving lessons: Compulsory theoretical and practical training lessons and exams. Minimum age for each license category.
- Legal access age: 16 for mopeds, 18 for motorcycles up to 25kW, 21 for motorcycles regardless the engine power
- Provisional driving licenses (according to driving experience): see above
- Helmet wearing law: Obligatory
- Compulsory periodical technical inspections: Obligatory periodical technical inspections
- Enforcement/penalty levels: Defined in the Greek traffic law
- Quality of road design standards with respect to powered two-wheeler specifications: Not in satisfactory level

COUNTRY EXAMPLE: GREECE

SAFETY PERFORMANCE INDICATORS

- Helmet/protective clothing wearing rate: **Not available**
- Alcohol and drugs related PTW accidents: **Partially available (alcohol only)**. In 2005 in Greece, 273 accidents occurred with at least one powered two-wheeler rider involved and at least one driver with an alcohol level above the legal limit.
- Speed related PTW accidents: **Not available**
- PTW active safety systems (ABS etc): **Not available**
- Degree of compliance with road design quality standards, with respect to powered two-wheelers: **Not available**

COUNTRY EXAMPLE: GREECE

SAFETY PERFORMANCE INDICATORS (2)

- PTW distribution in the vehicle fleet: *Available*.

In 2004 2.600.714 PTW's were registered in Greece, out of 7.860.142 vehicles (including mopeds). Therefore: $2.600.714 / 7.860.142 = 0,33$

- Comparisons to other modes of transport: *Available*.

Powered two-wheeler riders' deaths per million vehicles for 2005: $457 / 2,6 = 175,77$

Passenger car occupants' deaths per million vehicles for 2005: $816 / 4,07 = 200,49$

COUNTRY EXAMPLE: GREECE

FINAL OUTCOMES

- Number of killed powered two-wheeler riders: Available.
In 2005 in Greece 457 powered two-wheeler riders were killed.
- Number of injured PTW riders by injury severity type: Available.
Seriously injured PTW riders for 2005 in Greece: 920
Slightly injured PTW riders for 2005 in Greece: 7.569
- PTW riders' casualties by 1.000 veh-kms: Not available
- PTW riders' casualties by 1.000.000 inhabitants: Available. In 2005 in Greece 457 two-wheeler riders were killed and the population of Greece was 11 million people. The calculated indicator is $457/11=41,55$
- Reduction in PTW accidents in relation to the total accident reduction: Available. Killed PTW riders in Greece in:
1996: **541**
2005: **457**
People killed in road accidents in Greece in:
1996: **2157**
2005: **1658**

COUNTRY EXAMPLE: GREECE

FINAL OUTCOMES (2)

- Relative rate for fatality proportions in PTW riders by age group:
Available.
Killed powered two-wheeler riders aged 15-24 in 2005: 151.
Population aged 15-24 in 2005: 1.353.307
Relative rate (deaths per million population): 111,58
Killed powered two-wheeler riders aged 25-34 in 2005: 138
Population aged 15-24 in 2005: 1.710.716
Relative rate (deaths per million population): 80,67
- Number of powered two-wheeler riders wearing helmet/safety equipment: Not available

COUNTRY EXAMPLE: GREECE

SOCIAL COSTS

- Costs due to powered two-wheeler fatalities: Available
457 powered two-wheeler riders' fatalities * 1.200.000 € per fatality = 548.400.000 €
- Costs due to powered two-wheeler non-fatal accidents: Not available
- Costs related to material-damage-only powered two-wheeler accidents: Not available
- Value of Statistical Life: 1.200.000€ for a person killed

USING THE PYRAMID STRUCTURE

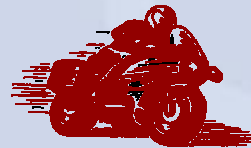
- In general, the pyramid allows for a complete picture of the road safety phenomenon and useful insight on the road accidents causality
- “Safety Performance Indicators” is the “weakest link”; in the middle of the pyramid impedes information flow
- The links between the layers of the pyramid are as important as the layers
- It is suggested to start from the “Safety Performance Indicators”, where the problem is identified and proceed to both sides



PROBLEMS IDENTIFIED

- Difficult/impossible to find critical behavioural data through macroscopic and in-depth surveys

- speeding



- aggressiveness



- alcohol



- fatigue



- Difficult/impossible to establish relations between behavioural data and safety performance

RECOMMENDATIONS

- New methods beyond macroscopic and in-depth surveys to collect necessary data
- Behavioural experiments on sufficiently representative samples
 - Stated preference recording attitude
 - Revealed preference recording behaviour through observations
- Specialised analyses linking:
 - safety output with safety behaviour/performance
 - safety measures with safety performance



RECOMMENDATIONS FOR THE ERSO

European Road Safety Observatory



- Pan-European behaviour surveys/experiments
- Quantity and Quality Performance Indicators
- Enhanced with more knowledge to become a useful platform for exchange of information across Europe
- EU recommendations for common information data collection
- Intensive specialised analyses to link:
 - safety output with safety behaviour/performance
 - safety measures with safety performance

