



ETSC, 13 December 2023

Reducing road deaths among motorcycle riders

The Riders perspective



FÉDÉRATION INTERNATIONALE
DE MOTOCYCLISME

Agenda

- Connected Motorcycle Consortium
- MC ABS use in accidents, [study](#)
- Motorcycle Riders wish list
- Q & A

FIM is the governing body for motorcycle sport and the global advocate for Motorcycling

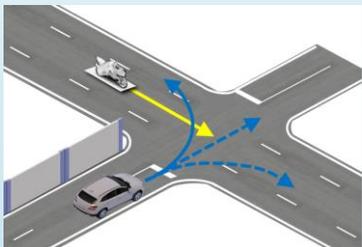
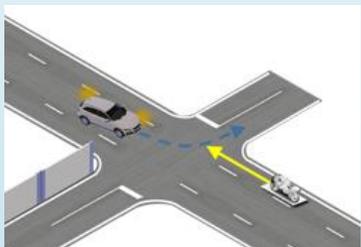
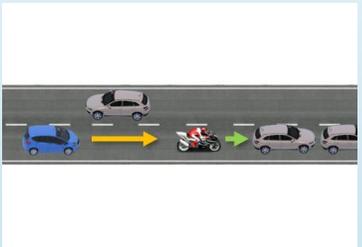
Jesper Christensen
Commission Director Mobility



Connected Motorcycle Consortium

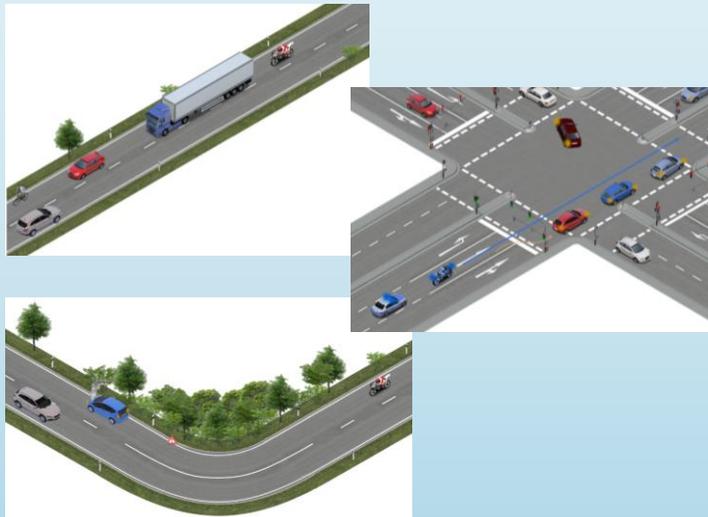
See and be seen by others

Use cases with highest safety relevance

| Crossing Traffic | Left Turn Across Path Opposite direction | Longitudinal traffic & Lane Change |
|---|--|--|
| ADAS | ADAS | ADAS |
|  |  |  |
| C-ITS | C-ITS | C-ITS |
|  |  |  |

Be aware of the unexpected

CMC specifications grants compatibility with C-ITS applications

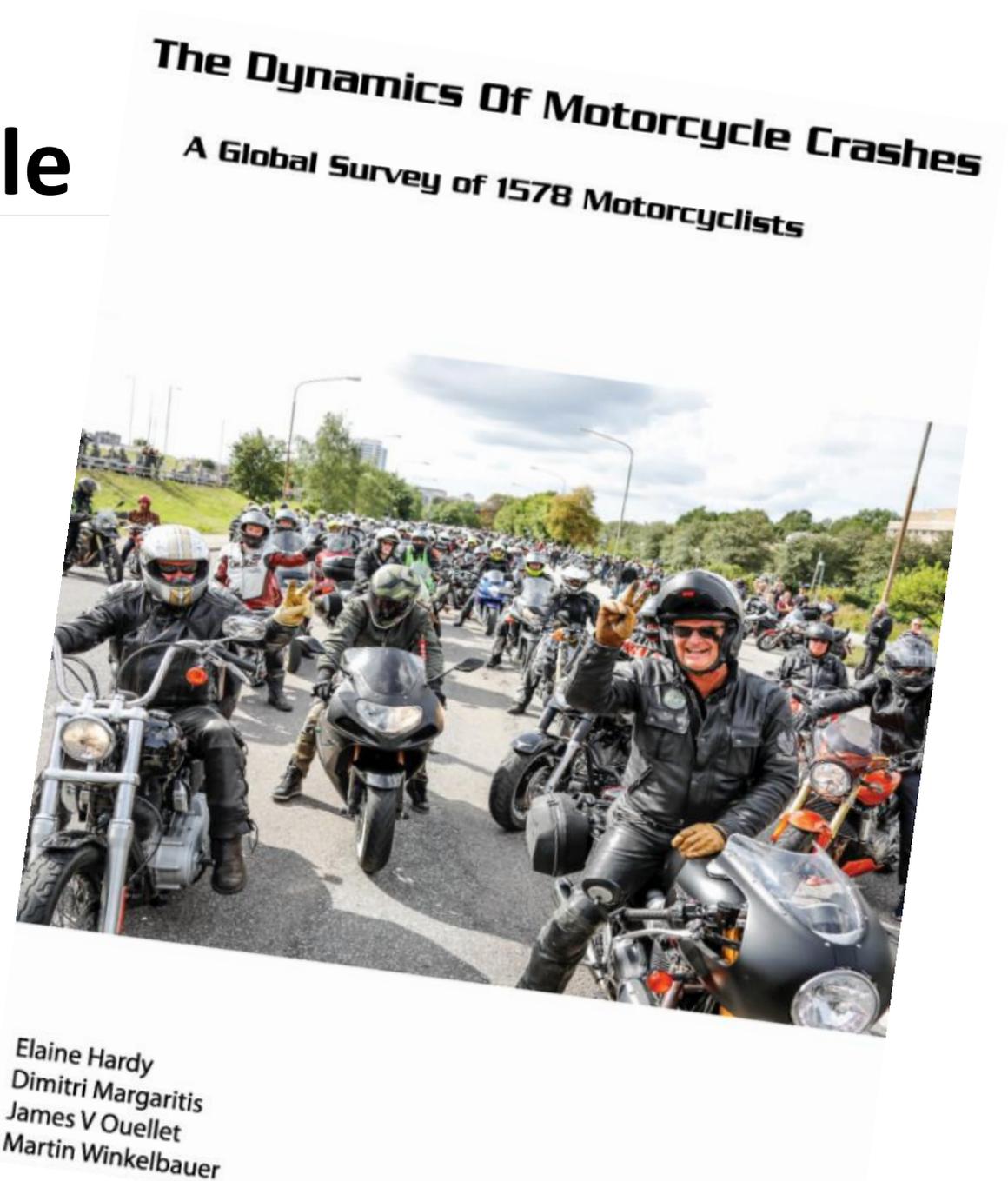
| Traffic situations |
|--|
| C-ITS: EEBL, SVW and AEWV * |
|  |

Experience ADAS and C-ITS technology in action

The Dynamics of Motorcycle Crashes

Focus on Advanced (Anti-lock) Braking Systems and Post-crash Motion

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Methodology, Objectives, Outcome

The survey covered eight different languages: English, French, Swedish, German, Spanish, Italian, Greek and Norwegian.

The on-line survey took place between May and October 2019. In total 1,578 motorcyclists from 30 countries replied to 39 questions, none were mandatory and the details of the respondents to the survey were anonymous.

The objectives of the survey were to find out what actually happens from the motorcyclists' perspective when they crash and the follow up events.

The survey's overall results highlight the relationship between speed, protective equipment, assistance systems and injuries, as well as how post-crash motions change with the crash occurrence and injury outcome.

Profile of Riders

Of the 1,578 responses to the survey:

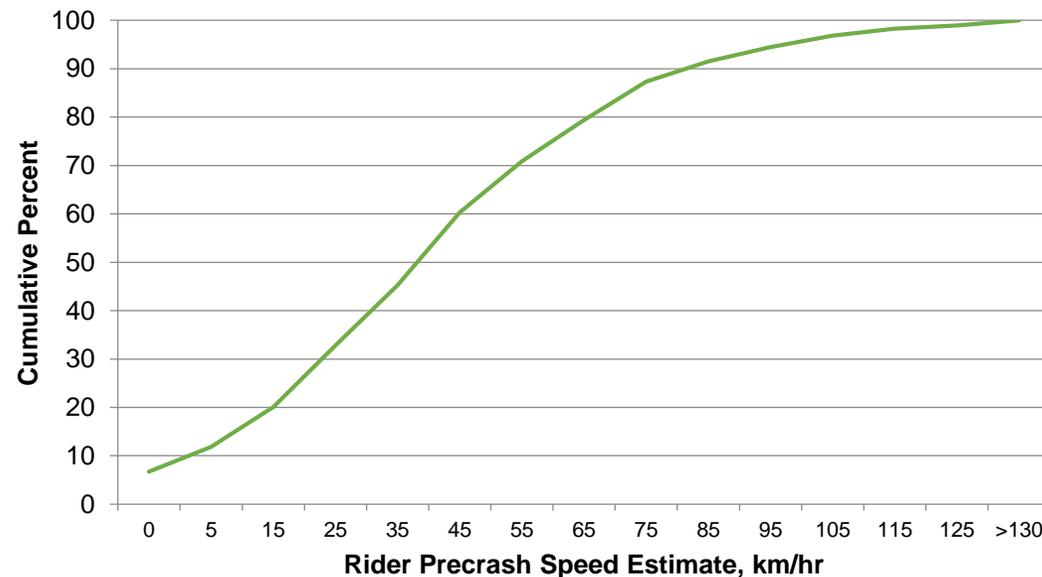
- These crashes were distributed somewhat evenly around the week, with Saturday over-represented (20%) and Monday underrepresented (9.5%). About three-fourths occurred between 8 a.m. and 6 p.m. Female riders made up 8% of respondents.
- Eighty-four percent of riders reported living in EU countries (including the UK), 6% in the USA-Canada, and 8% in Australia. Riders with full licences represented 86% of respondents.
- Ninety-one percent of the respondents were male; the median age was 44 and the largest age group was in the 45-54 age range. Only one in 40 (2.5%) said they had been riding less than a year while five percent said they had been riding over 40 years consecutively.
- Motorcycles accounted for about 90% of the total PTWs. Scooters and mopeds combined made up about another 5%.
- Fifty-seven percent fell into the 500-1000 cc range and another 28% were larger than 1000cc. Motorcycles under 500cc were only 15% of the total.



Motorcycle pre-crash speed

We asked riders to estimate their speed within a 10 km/hr range and assumed they were giving us the pre-crash speed. Figure 1 shows a cumulative percent distribution of the estimates given by 1,413 riders (150 estimated in miles per hour, while 15 gave no answer.)

The median speed fell in the 31-40 km/hr range (19-25 mph) while the 90th percentile speed was around 80 km/hr (50 mph).



Braking and Advanced Braking Systems

| Training for Emergency Braking | Did your motorcycle have Antilock brakes (ABS) | | | | Total |
|--------------------------------|--|--------|-----------|--------|--------|
| | No Answer | No | Uncertain | Yes | |
| No | 23 | 650 | 11 | 321 | 1005 |
| | 79.3% | 67.8% | 64.7% | 56.0% | 63.7% |
| Yes | 6 | 309 | 6 | 252 | 573 |
| | 20.7% | 32.2% | 35.3% | 44.0% | 36.3% |
| Total | 29 | 959 | 17 | 573 | 1578 |
| | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

The highest proportion of motorcyclists who had completed post licence training, did training for emergency braking (36.3%). Of those, 44% (n.252) had motorcycles equipped with ABS at the time of the crash.

Prior to crashing, did you apply the brakes

| MC had ABS | N/a | No | Uncertain | Yes | Total |
|------------|-------|-------|-----------|-------|-------|
| No Answer | 1 | 9 | 4 | 15 | 29 |
| | 3.7% | 1.6% | 3.7% | 1.7% | 1.8% |
| No | 15 | 282 | 57 | 605 | 959 |
| | 55.6% | 51.0% | 52.8% | 68.0% | 60.8% |
| Uncertain | 0 | 3 | 2 | 12 | 17 |
| | 0.0% | 0.5% | 1.9% | 1.3% | 1.1% |
| Yes | 11 | 259 | 45 | 258 | 573 |
| | 40.7% | 46.8% | 41.7% | 29.0% | 36.3% |
| Total | 27 | 553 | 108 | 890 | 1578 |
| | 100% | 100% | 100% | 100% | 100% |

| Technology | Frequency | Percent |
|-----------------------|-----------|---------|
| Antilock brakes (ABS) | 573 | 36.3 |
| Traction Control | 190 | 12 |
| Cornering ABS | 101 | 6.4 |

35%



Pre-crash Brake Use by Riders With or Without ABS

| MC had ABS | | Rider Applied Brakes Before Crash | | |
|------------|-----------|-----------------------------------|------|-------|
| | | No | Yes | Total |
| No | Frequency | 282 | 605 | 887 |
| | % | 31.8 | 68.2 | 100 |
| Yes | Frequency | 259 | 258 | 517 |
| | % | 50.1 | 49.9 | 100 |
| Total | Frequency | 541 | 863 | 1404* |
| | % | 38.5 | 61.5 | 100 |

*Excludes "Uncertain/no answer"

$X^2 = 46.2, p < .01$



Mechanism Matters

- The post-crash motion “Topside” occurred in 63% of those cases where the rider collided with a car. In terms of injuries this type of trajectory dominates both the range of type or location of injuries and the severity.
- Left Low-side and Right Low-side also have high levels of injuries by type. But compared to the Topside trajectory, less time was spent in hospital.
- This study suggests that the rider's trajectory in the crash strongly influences the range of injuries riders sustain and also the injury severity.
- In nearly every body region, "Topside" – ejection forward over the handlebars – accounted for more injuries than any other trajectory. In addition, riders who ejected Topside were more likely to be hospitalized than riders who had some other trajectory and they were more likely to be hospitalized for longer.



Summary

- 1578 motorcyclists from 30 countries replied to the survey
- 36.3% of the motorcycles had Advanced Braking Systems, 12% had traction control.
- 35% of the riders did not use their brakes prior to crashing and of these, n.259 (46.8%) had ABS brakes fitted.
- Only half the riders on ABS-equipped motorcycles reported braking before they crashed compared to two-thirds of those on a motorcycle without ABS.
- 65% of riders admitted to hospital were travelling under 70 kph (44 mph).
- Speed does not appear to have a strong effect on injury severity.
- Injury mechanism seems to matter more, in particular, the post crash trajectory of the rider. Mechanism strongly affects not only the type and range of injuries but also the severity of the injuries as measured by hospitalization.

The Riders Wishlist – back to basic

- Governments and road owners must focus on and show that motorcycles are part of Vision Zero
- Road owners must follow their own book of rules:
 - Ensure predictable friction, a smooth, clean road surface, no dangerous roadside objects, run-off zones or "good for all" guardrails.
 - Pay attention to visibility, bus lanes, and parking facilities.
- Update the driving license directive with risk- and accident-based focus education, including a general understanding of other vehicles for all
- Enforcement should not only target speed but also prioritize valid drivers' licenses





THANK YOU



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