

Root Causes of Motorcyclist Crashes: Does our cause identification system limit our vision for solutions?

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Hurt Study identified crash causes

The identification of the causes of motorcyclist crashes in the US is predominately based on the information and cause identification in the Hurt Study.¹ In general; Hurt told us motorcyclist crashes are predominately caused by *Human Factors*

- The driver of the other vehicle violating the motorcyclists right-of-way
- The motorcyclist lacks skills
- The motorcyclist lacks a traffic strategy
- Lack of attention
- Lack of license
- Alcohol and
- Speed

Hurt also identified *Vehicle Factors and Environmental Factors* and told us that these two categories account for a very minor percent of crash causation.

All of the identified causes make logical sense. All of the causes are derived from Hurt's research and supported by additional research studies.

The *Human Factors* in the Hurt study as the causes of motorcyclist crashes have become the norm in the US and can be termed the "traditional view." These causes and the traditional views derived from them have been the driving force behind solutions.

For example, when we identify the cause of the motorcyclist crash as the driver of the other vehicle violating the motorcyclist's right-of-way, it is reasonable to believe that a campaign to get motorists to "Look Twice to Save a Life" would be a good solution.

When we identify the cause of the crash as the motorcyclist lacks skills, it is reasonable to believe that requiring motorcyclists to take a skills training course would be a good solution.

When we identify the cause of the motorcyclist crash as alcohol it makes sense to begin a don't drink and ride campaign or if the cause is identified as speed to set speed limits or begin a "Speed Kills" campaign.

But what if these identified causes of motorcyclist crashes are NOT the root cause but only a symptom of the cause?

The solutions we have tried over the past 40 years to reduce or eliminate motorcyclist crashes and the associated deaths and injuries simply have not worked. For example, there is little or no evidence that rider training or motorist awareness (the two primary solutions based on two top ranking traditionally identified causes) have had any effect on crash reduction.

MAIDS study identified crash causes

The European Motorcycle Accident In-Depth Study² (MAIDS) study like the Hurt Study used the same three broad categories of *Human, Vehicle and Environmental Factors*. Similar to Hurt, MAIDS identifies that 87.9% of the causes of motorcyclist crashes fall into the *Human Factors* category.

However, in stark contrast to Hurt, MAIDS delineates the *Human Factors* as falling into four sub-categories:

- Perception failure
- Comprehension failure
- Decision failure and
- Reaction failure

In the US, causes of crashes lean heavily toward improper physical actions or failure to take a proper physical action (as identified in Hurt) whereas the causes as based on MAIDS are identified as mental or processing failures.

The thinking here is that the overt physical action or lack of action we observe on the part of the motorcyclist or other vehicle driver is a symptom of the root cause and not the true root cause. The root causes are, in fact judgment, comprehension and decision making failures.

The real or root causes

A motorcyclist runs through a red light traveling at a high rate of speed and strikes a van, killing the rider and injuring the occupants of the van. Is speed and failure to yield the cause of this crash? If our conclusion is in the affirmative we are pointed toward certain actions as possible solutions. However, if our conclusion regarding the cause is incorrect, it is unlikely the corresponding solutions will have any impact.

After investigation it is determined the rider was over the allowed alcohol limit and didn't have a proper endorsement. Is alcohol impairment and lack of proper license the cause of this crash? If our conclusion is in the affirmative we are lead toward certain actions as possible solutions. However, if our conclusion regarding the cause is incorrect, it is unlikely the corresponding solutions will have any impact.

It is obvious that a rider who rides without a proper license, rides after drinking and rides at a high rate of speed through a red light has made some huge decision and judgment errors. It would not matter if this rider had gained a proper license after taking a rider training course because the root cause of the crash is not lack of training or licensing. It is not much of a stretch to say the root cause of almost all motorcyclist crashes is an error in judgment or decision making.

Failure to attend, an error in scanning traffic, and perception errors are likely next in line as root causes. Running a red light is a good example. Failure to stop for a red light is obviously an error and we could list this as the cause of the crash. However, if we design solutions based on our decision about the cause and this decision is incorrect, our solutions will not likely have any impact. In this case we may institute remedial training regarding signs and signals, increase enforcement or add a question about red lights to the licensing test. In this example, failure to

attend is more likely the root cause of running the red light. Our intervention should be directed toward attending to the driving task.

Different training needed

For some time now this writer has been considering the idea that when we make a mistake in identifying the "root cause" of a crash, the interventions we are pointed at will have little or no impact. In the US we tend to be very "surface" in identifying the cause of a crash - usually identifying a physical action - speeding, failure to yield, too fast for conditions, reckless driving, running red lights, alcohol impaired.

In Europe the following terms are more often used to identify causes of crashes - perception failure, attention failure, traffic scan error, faulty traffic strategy. And the big one - judgment/decision making error.

Identifying the lacking of a physical skill as the cause of a motorcyclist crash logically points us to the need for training - and in the US most of the training available is training in physical operation skills from basic courses to advanced on track courses. There is little evidence, however that such courses result in reduced crash risk. If we identify the root cause more along the lines of the terms identified above as more often used in Europe we might still select "training" as an intervention but the training would look much different than that currently readily available in the US.

Summary example

The classic is the lone motorcyclist running off the road in a curve. How many different "causes" could we identify for this? If we eliminate alcohol the most common cause identified by rider training professionals is "the rider doesn't know how to countersteer" and we cycle (pun intended) right back to physical training. The more likely cause is however, that the rider failed to recognize, analyze and anticipate the curve and misjudged his approach speed. This suggests a need for a type of rider training very different from the training most U.S. states require prior to obtaining a motorcyclist license.

1. Hurt Report. The report is known by the last name its primary author, Professor Harry Hurt. The full title of the report is Motorcycle Accident Cause Factors and Identification of Countermeasures, Volume 1: Technical Report. Available at: http://smarter-usa.org/wp-content/uploads/2017/06/1.motorcycle-accident-cause-factors-and-identification-of-countermeasures_volume1_technical_report2.pdf
2. European Motorcycle Accident In-Depth Study. A summary of findings can be accessed at: http://smarter-usa.org/wp-content/uploads/2017/06/4a_MAIDS_Summary_of_Findings.pdf