

USE OF MOTORCYCLE HELMETS IN YOGYAKARTA : SOME OBSERVATIONS AND COMMENTS *

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ABSTRAK

Cedera kepala merupakan sebab utama kematian dalam kecelakaan sepeda motor. Penelitian di Amerika Serikat, menunjukkan pemakaian helm mengurangi risiko cedera dan kematian. Penelitian ini meneliti ketaatan terhadap peraturan pemakaian helm di Yogyakarta. Data dikumpulkan melalui observasi sistematis (N=9242) dan wawancara terbuka (n=150) di lima jalan utama yang berbeda di seluruh kota. Ketaatan umum terhadap peraturan pemakaian helm adalah 87% untuk pengemudi, dengan variasi kepentingan terhadap waktu dan tempat. Hanya 55% pengemudi memakai helm dengan baik (dengan tali di ikatkan) dan hanya 20% penumpang memakai helm. Jadi hanya 50% orang yang naik sepeda motor terlindungi secara maksimum. Di dalam wawancara, responden mengatakan ketidak-enakan fisik dan "malas" sebagai alasan paling umum untuk tidak memakai helm; beberapa orang menyatakan helm tidak perlu di jalan-jalan kota dan di waktu malam. Wawancara mengisyaratkan bahwa orang yang naik sepeda motor memakai helm kebanyakan karena takut di tegur polisi dan responden hanya tahu sedikit tentang nilai keselamatan helm.

Banyaknya pemakaian helm sekarang ini merupakan ketaatan semu ("token compliance") terhadap peraturan. Dari hasil studi diusulkan cara-cara agar keselamatan pemakaian helm di Indonesia bisa ditingkatkan.

KEY WORDS – Motorcycle helmet usage, Helmet compliance, Head injury protection.

INTRODUCTION

Over the past three decades the use of motorcycle safety helmets has become more common in many countries throughout the world. In the United States, nearly all states passed mandatory use laws in the late 1960s, but in response to pressures from motorcycle user groups many states repealed the laws a decade later (some states later reinstated the laws). In Indonesia, the first mandatory helmet law was enacted in 1985 for Jakarta, and in 1986 the Department of Transportation instituted a regulation making helmet usage mandatory for all motorcyclists (Surat Keputusan Menteri Perhubungan RI. No. :KM. 188/Aj.

403/PHB/86). This makes Indonesia one of the few Asian countries with a motorcycle helmet law that is even partly enforced.

Head injuries are the major cause of motorcycle fatalities⁽¹⁾. Considerable research done in the United States demonstrates that wearing helmets significantly reduces fatalities from motorcycle accidents as well as head and neck injuries of all types. Studies indicate that more than 25% of motorcyclists killed without wearing helmets would not have died had they worn helmets⁽²⁾. A five year study estimated that helmets are 29% effective in preventing fatalities, suggesting that 4,645 lives were saved by helmets during that time period⁽³⁾.

* This paper is dedicated to my friend Thomas Marzolf, who died from head injuries suffered in a motorcycle accident in Yogyakarta the same day we were collecting data for this study. He was not wearing his helmet.

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RUNING HEAD : Use of Motorcycle Helmets in Yogyakarta

A National Highway Traffic Safety Administration study of four states concluded that "riders without helmets had twice the overall head injury rates as helmeted riders and up to six times the critical or fatal head injury rate⁽⁴⁾. Another study estimates that after repeal of mandatory helmet laws, fatality rates increased by an average of 21.3%⁽⁵⁾. The evidence is consistent that helmets reduce fatalities and injuries from motorcycle accidents.

For helmets to be effective, however, they must be worn by motorcyclists. Studies in the United States suggest that less than 50% of motorcyclists wear helmets when they are not required by law, while compliance is nearly 100% when laws are in effect and enforced⁽⁶⁾.

This study examines compliance with the motorcycle helmet regulation in Yogyakarta, Indonesia. Yogyakarta is a city of about 450,000 in the central part of Java, and the capital of the province Special District Yogyakarta (population 2.9 million). It is also a university oriented community, with over 60,000 students attending institutions of higher education. Motorcycle is the most common form of motor transport in Yogyakarta, with over 150,000 registered motorcycles in the province (ten times the number of passenger cars)⁽⁷⁾. According to police figures in 1987 there were 253 injuries from motorcycle accidents in Special District Yogyakarta⁽⁸⁾, which accounted for about half of all motor vehicle accident injuries. Hospital personnel suggest that these reported accidents underestimate of the actual number of motorcycle accidents and injuries.

Informal observation suggests that a considerable proportion of motorcyclists do not wear helmets when riding motorcycles. In this study we examine how many motorcyclists wear helmets, wear them correctly for do not wear them at all, and begin to explore some of the reasons for this uneven compliance with the law.

METHOD

Helmet use was observed at 5 different locations in Yogyakarta on October 21, 1989 from 6:00 to 20:00. The day was a Saturday, which in Indonesia is half a regular workday. The weather was clear and dry. The locations were all heavily traveled main roads, but in specifically chosen different parts of the city. For example, our observation point on Jl. Kaliurang was in the extreme north of city and near Gadjah Mada University, on Jl. Malioboro in the heart of the shopping area, on Jl. Solo and Jl. Magelang on major roads into and through Yogyakarta, and on Pojak Beteng, a location in the southern part of the city.

Research teams of 3 to 5 observers were stationed at a traffic light and counted helmet usage on all motorcycles that were stopped at a red light during the observation periods. Observations took place for the first twenty minutes every two hours (10 minutes in each direction on twoway roads) for a total of 8 observation periods. Data were systematically recorded on a tally sheet, including the sex of drivers and passengers. Categories for recording for motorcycle drivers included (1) wearing a helmet properly; (2) wearing a helmet but

not properly; (3) carrying the helmet; and (4) not having a helmet visible. Passengers were recorded only as wearing a helmet or not.

We wanted to distinguish between those drivers who wore a helmet properly and those who did not, since helmets need to be worn properly to maximize their safety protection. Typically not wearing a helmet properly was wearing it without the chinstrap firmly fastened.

To attempt to better understand helmet usage in Yogyakarta, two weeks later we conducted a 150 interviews with motorcycle drivers in parking areas near our original observation sites. We asked our respondents open-ended question about when they wore helmets, when they did not, and why. This was an accidental sample, so no statistical representativeness can be implied. Yet we felt these interviews gave us important information to help explain the incomplete compliance with the law.

FINDINGS FROM THE OBSERVATIONAL STUDY

Over the study period we recorded 9242 observations. For motorcycle drivers overall compliance with the helmet law was 87%, ranging from 38% on Jl. Magelang to 51% on Jl. Kaliurang. However, proper wearing of helmets (with chinstrap firmly fastened) was considerably lower. On Jl. Magelang nearly 67% of drivers wore their helmets properly, as compared to about 30% on Jl. Kaliurang. Of the 13% who did not wear helmets, about half (6%) carried them along. By far the highest rate of non helmet use was on Jl. Kaliurang, where over 25% of the drivers did not even

carry helmets with them. The differences by sex were small and not totally consistent. (See Table 1)

Only 20% of the passengers on motorcycles wore helmets at all. This ranged from a high of 23% on Pojak Beteng to a less than 10% on Jl. Kaliurang. (See Table 2)

Compliance with the helmet regulation varied by time of day. The data between 6:00 and 14:00 is rather consistent; 7% to 10% drivers did not wear helmets during those hours. Later in the day, however, helmet usage decreased; at 16:00 15%, at 18:00 19% and at 20:00 21% of drivers did not wear helmets. But these overall figures are somewhat deceptive; the decreases were mostly Jl. Solo and Jl. Kaliurang, with an additional decrease at Jl. Malioboro at 20:00. There was considerably less variation with passengers. (See Table 3)

RESPONSES TO THE INTERVIEWS

We interviewed 105 male and 45 female motorcyclists. They ranged in age from 16 to 50 years old, with 101 between 16 and 25. Approximately 50% were university or academy students and 10% were SMA (high school students), with the remainder working at various jobs. In general, the sample was young and educated. In this section, we report the most common responses to our questions.

Motorcyclist said they wore helmets when driving their motorcycles on main roads, crowded streets, 'jalan protokol' (required streets), and out of the city. They wore them most during morning through early afternoon (siang) and when

Table 1
OBSERVATIONS OF MOTORCYCLE DRIVERS (PENGEMUDI)
October 21, 1989

Place and Sex

| Place | Sex | Wearing Helmet Correctly | Not Wearing Helmet Correctly | Only Carrying Helmet | Doesn't Have Helmet | Total |
|---------|-----|--------------------------------|---------------------------------------|----------------------------|---------------------------|-------|
| MAL | M | 1301 | 598 | 19 | 23 | 1941 |
| % | | 67% | 31% | 1% | 1% | |
| | F | 258 | 133 | 5 | 1 | 397 |
| % | | 64% | 34% | 1% | 1% | |
| SOLO | M | 351 | 666 | 296 | 43 | 1956 |
| % | | 49% | 34% | 15% | 2% | |
| | F | 330 | 289 | 31 | 31 | 681 |
| % | | 48% | 42% | 5% | 5% | |
| MAG | M | 584 | 371 | 7 | 5 | 967 |
| % | | 60% | 38% | 1% | 1% | |
| | F | 82 | 62 | 2 | 2 | 148 |
| % | | 54% | 42% | 2% | 2% | |
| POJ | M | 1057 | 666 | 15 | 28 | 1766 |
| % | | 60% | 38% | 1% | 2% | |
| | F | 138 | 70 | 3 | 7 | 218 |
| % | | 63% | 32% | 1% | 3% | |
| KALI | M | 283 | 182 | 216 | 227 | 908 |
| % | | 31% | 20% | 24% | 25% | |
| | F | 59 | 61 | 67 | 73 | 260 |
| % | | 23% | 24% | 26% | 28% | |
| TOT — M | | 4176 | 2483 | 553 | 326 | 7538 |
| AL | | 55% | 33% | 7% | 4% | |
| | F | 867 | 615 | 108 | 114 | 1704 |
| | | 51% | 36% | 6% | 7% | |
| Total | | 5043 | 3098 | 661 | 440 | 9242 |
| % | | 55% | 34% | 7% | 4% | |

Table 2
OBSERVATION OF MOTORCYCLE PASSENGERS (PENUMPANG)
October 21, 1983

Place and Sex

| Place | Sex | Wearing Helmet | Not Wearing Helmet | |
|-------|-----|-------------------|-----------------------|---------------------------|
| MAL | M | 90 | 310 | |
| % | | 23% | 77% | |
| F | | 162 | 489 | |
| % | | 27% | 73% | |
| SOLO | M | 60 | 363 | |
| % | | 14% | 86% | |
| MAG | M | 47 | 145 | |
| % | | 10% | 90% | |
| | F | 68 | 276 | |
| % | | 20% | 80% | |
| POJ | M | 108 | 263 | |
| % | | 29% | 71% | |
| | F | 81 | 213 | |
| % | | 29% | 71% | |
| KALI | M | 22 | 195 | |
| % | | 10% | 90% | |
| | F | 16 | 207 | |
| % | | 7% | 93% | |
| TOT | M | 327 | 1276 | |
| AL | | 20% | 80% | |
| | F | 395 | 1543 | |
| | | 20% | 20% | |
| Total | | 722 | 2819 | 3541 (Total Observations) |
| % | | 20% | 80% | |

Table 3
OBSERVATIONS MOTORCYCLE DRIVERS (PENGEMUDI)
AND PASSENGERS (PENUMPANG)
October 21, 1983

At Different Times of the Day

| Time | DRIVERS | | | PASSENGERS | | |
|-------|---------------------|----------------------|---------------------|------------|--------------------|------------|
| | Number Observations | Only Carrying Helmet | Doesn't Have Helmet | Total | Not Wearing Helmet | |
| 6:00 | MAL | 211 | 0 | 0 | 42 | 30 |
| | SOLO | 148 | 5 | 1 | 56 | 47 |
| | MAG | 145 | 1 | 1 | 66 | 60 |
| | POJ | 134 | 1 | 2 | 42 | 23 |
| | KALI | 146 | 42 | 30 | 65 | 56 |
| | | 788 | 49 6% | 34 4% | 271 | 219 81% |
| 8:00 | MAL | 223 | 0 | 00 | 71 | 47 |
| | SOLO | 282 | 4 | 2 | 50 | 37 |
| | MAG | 157 | 0 | 0 | 66 | 50 |
| | POJ | 229 | 1 | 1 | 55 | 35 |
| | KALI | 152 | 27 | 56 | 43 | 42 |
| | | 1049 | 32 3% | 59 6% | 285 | 211 74% |
| 10:00 | MAL | 274 | 0 | 3 | 85 | 72 |
| | SOLO | 433 | 21 | 6 | 105 | 82 |
| | MAG | 137 | 0 | 0 | 68 | 50 |
| | POJ | 212 | 0 | 1 | 57 | 38 |
| | KALI | 121 | 26 | 28 | 38 | 33 |
| | | 1177 | 47 4% | 38 3% | 343 | 275 81% |
| 12:00 | MAL | 351 | 0 | 0 | 71 | 54 |
| | SOLO | 319 | 14 | 9 | 113 | 94 |
| | MAG | 172 | 0 | 0 | 56 | 45 |
| | POJ | 205 | 0 | 3 | 68 | 55 |
| | KALI | 168 | 41 | 38 | 41 | 38 |
| | | 1215 | 55 5% | 50 4% | 349 | 286 82% |

| | | | | | | |
|-------|------|------|-----|----|-----|-----|
| 14:00 | MAL | 604 | 1 | 0 | 42 | 34 |
| | SOLO | 265 | 16 | 11 | 81 | 76 |
| | MAG | 151 | 0 | 0 | 60 | 44 |
| | POJ | 196 | 2 | 4 | 86 | 60 |
| | KALI | 118 | 29 | 26 | 61 | 54 |
| | | 1334 | 47 | 41 | 330 | 268 |
| | | | 4% | 3% | | 81% |
| 16:00 | MAL | 197 | 2 | 0 | 154 | 93 |
| | SOLO | 293 | 29 | 4 | 117 | 100 |
| | MAG | 108 | 2 | 0 | 30 | 21 |
| | POJ | 230 | 4 | 5 | 84 | 64 |
| | KALI | 159 | 42 | 43 | 38 | 38 |
| | | 897 | 79 | 52 | 433 | 316 |
| | | | 9% | 6% | | 73% |
| 18:00 | MAL | 207 | 4 | 4 | 231 | 176 |
| | SOLO | 329 | 80 | 11 | 129 | 109 |
| | MAG | 147 | 5 | 5 | 80 | 67 |
| | POJ | 191 | 4 | 8 | 114 | 85 |
| | KALI | 172 | 34 | 45 | 102 | 92 |
| | | 1046 | 127 | 73 | 656 | 529 |
| | | | 12% | 7% | | 81% |
| 20:00 | MAL | 267 | 17 | 17 | 304 | 225 |
| | SOLO | 551 | 158 | 6 | 247 | 236 |
| | MAG | 98 | 0 | 0 | 100 | 84 |
| | POJ | 260 | 6 | 11 | 138 | 114 |
| | KALI | 124 | 32 | 34 | 53 | 50 |
| | | 1300 | 213 | 68 | 882 | 709 |
| Total | | | 16% | 5% | | 80% |

they drove long distances. They said they wore them near police posts ("dekak pos polisi") and during police operations ("operasi helm" or "razia") aimed at enforcing the helmet law.

Respondents said they did not wear helmets on campus, in the kampung (village), on city streets, where there were no big roads, and on short trips. They wore them least in the late afternoon (sore), evening and night. They said they often did not wear them when there

were no police nearby or when there was no police helmet operation. Some said they did not wear helmets when it was hot.

We asked our respondents why they did not wear their helmets. The two most common responses were malas and physical discomfort. Malas literally means "lazy" but in this case seems to mean "I don't want to." Many motorcyclists mentioned discomfort; for example, "helmet feels too tight, "too heavy,"

"a burden on the head," "gives me a headache", or "makes me dizzy". Others said it makes the hair untidy or itchy, or it was not practical especially during the hot season (panas). Some said they didn't wear helmet when there was no police operation or because it was not a habit. A few said the helmets were not very good.

Our final question asked respondents what would make people wear helmets more. The most common response was more enforcement of traffic laws including: "Afraid of police operation; "Don't want to pay a fine"; or " People should wear helmets because of police operation. " But others pointed out that "some people wear helmets only as a formality" or "sometimes people put them on only for the police."

We should also note that a few respondents remarked that many available helmets were of inferior quality, thus compromising protection. For example, one respondent said "Good safety with helmets is not possible because helmets are not standardized and are expensive." A few others also noted the need for better helmet design and protection.

DISCUSSION

Helmet use by motorcyclists in Yogyakarta is uneven. Our data shows an overall compliance with the helmet law among drivers to be about 87%, ranging to as high as 88% (e.g., Jl. Magelang). While at first glance, this seems like reasonably good compliance rate, closer observation suggests these numbers may actually be slightly inflated and don't

reflect the actual safety/risk factors for motorcyclists in Yogyakarta. First, our data collection (inadvertently) took place a week after the police publicized the beginning of an operation to fine motorcyclists without helmets. While we did not see any police activity during our observing period, the newspapers had already announced that a two month police operation would begin. This may have somewhat increased helmet use. Second, over one third of those who wore helmets did not wear them properly. Specifically they left the chinstrap dangling loosely or unbuckled, so a serious jolt during an accident could easily knock the helmet off, severely compromising their protection. Third, since we only observed on main, busy streets, we believe compliance would be considerably lower on byways and backroads and in the kampung.

Time and place seem to affect helmet use. Motorcyclist's use of helmets on Jl. Kaliurang was much lower than the other sites. Jl. Kaliurang is the major road to and through Gadjah Mada University, the city's largest university. It is heavily traveled by students to and from their residences as well as being a road in and out of the city. In our interviews, high school and college students said they wore helmets less than did working people over 25 (data not reported here). In addition, the interviews suggested that motorcyclists think that helmets are less necessary for traveling short distances. In any case, compliance was significantly less here than anywhere else we observed.

Time also seems to affect helmet usage, at least in some locations. Helmet use decreases in the afternoon and continues to decrease until dark. While we do not have any data to confirm this, it is consistent with our other data to suggest this may be at least, in part due to the perception of less police surveillance in some locations after 14:00. It is interesting to ask whether helmet usage would continue to decrease after 20:00, when it is fully dark. Unfortunately, we have no data on this.

It is clear from the data that motorcycle passengers (*penumpang yang boncengan*) have even lower compliance rates. While the law requires both drivers and passengers to wear helmets, the general belief is that it will only be enforced for drivers. Roughly 20% of passengers wear helmets and if, like drivers, one third of them wore them improperly, perhaps only 13% of passengers are protected in case of an accident.

Some mention needs to be made about the quality of helmets available in Indonesia. The quality and price of helmets varies widely; helmets can be purchased for as little as Rp. 3000 (less the U.S. \$2.00) or as much as Rp. 40,000 (U.S.\$23.00). Informal observation of the shops selling helmets and motorcyclists wearing them suggest that most helmets used cost in the Rp. 8000 to Rp. 15,000 range. The helmets on the low end of the scale are plastic and similar to "batter's" helmets available in the U.S. It is doubtful they would provide much protection in a serious accident. It is unclear how well those in the middle price ranges perform in accidents. Members of our

research team had said they knew of cases of cracked helmets in accidents. The more expensive helmets appear to be of excellent construction, but we have no way of judging this. One major problem is there is no standardization (or testing) of helmets in Indonesia as there are in many western countries. Thus motorcyclists have no way of judging the safety level of their helmet. Indeed some are quite skeptical about their quality.

Even if we put the issue of the quality of helmets aside, the risk rate of motorcyclists in Yogyakarta is high. Only 55% of drivers wear their helmets properly on the major roads we studied, and perhaps about 13% of passengers do so. Added together, less than 50% of people riding motorcycles are maximumly protected by motorcycle helmets. We feel this risk rate of 50% is unnecessarily high and can be decreased, thus reducing injury and death by motorcycle accident.

NOTES ON INCREASING HELMET USE

The primary way to reduce the risk rate of motorcyclists is to increase the number of drivers and passengers who wear their helmets properly. There are at least three ways where risk can be reduced: enforcement, education, and helmet quality.

As our observational data suggest and as our respondents told us, police enforcement of the helmet law can increase compliance. There are small road signs throughout Yogyakarta reminding motorcyclists to wear helmets and police operations seem to at least temporarily increase helmet usage. But

increasing compliance itself is not enough, because much of the helmet usage is a token compliance that only marginally increases safety: motorcyclists put on helmets when they think police are near, but they don't wear them properly or pay much attention to the safety value of the helmet. It seems that both for motorcyclists and the police, having a helmet on the head is enough to comply with the law, regardless of whether it substantially increases safety. As one respondent noted, wearing motorcycle helmets is often seen as a formality, to comply with the law rather than an issue of safety.

In this context, surprisingly few respondents mentioned safety as a factor for wearing helmets. While we did not ask directly, our interviews showed little evidence that motorcyclists know much about how helmets can reduce the risk of injury. Although public education is a limited strategy for improving personal health and safety, it is likely that more information about motorcycle accident risk and helmet protection could positively affect helmet use. Such efforts, through the mass media or driver's license bureau, might be especially aimed at motorcyclists who wear their helmets but improperly and those who carry them along. For these people, only a small change in health behavior (putting on the helmet and/or buckling the strap) could substantially reduce their risk. A important area for risk reduction is passengers; education efforts should also emphasize that passengers are equally at risk as drivers. Another goal of public education could be to rebut the unfound-

ed myths that seem common in the culture; for example, that helmets are not necessary on city streets.

Finally, it is important that Indonesia begin a program of standardizing helmets, so that motorcyclists can be assured that their helmets afford at least a minimal level of protection. There are currently international helmet protective standards available⁽⁹⁾ that could be adapted to the Indonesian situation. It is likely that many of the helmets currently in use would not meet this standard and would need to be replaced with higher quality helmets. Good helmets are expensive, but not as expensive as the costs of severe head injuries and disabilities. As a society, Indonesia would probably save money on medical and disability costs with increased investment in and attention to the quality of helmets.

CONCLUSION

Indonesia's helmet law is a good beginning to decreasing injury and disability from motorcycle accidents. While in Yogyakarta the overall figures of compliance with the motorcycle helmet law seem reasonably good, closer analysis shows that less than 50% of people riding on motorcycles are maximally protected in case of an accident. Thus from a public health point of view, the risk rate for motorcyclists is much greater than necessary and can be reduced. We argue that increased police enforcement of the law could increase helmet usage, but often leads to a token compliance that does not substantially reduce injury risk in case of an accident. In addition to

enforcement, specific public education programs and standardization of helmet's protective quality could increase safety.

It is likely that motorcycles will remain the most common form of personal motor transport in Indonesia for the near future. As we have shown, there is considerable room for reducing risk and increasing the safety margin, thus saving lives, decreasing unnecessary injuries and disabilities, and reducing medical care costs.

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