

TRB Annual Meeting

Effects of Opioid Impairment on Motor Vehicle Crashes, Injury Severity, and Hospital Charges --Manuscript Draft--

Full Title:	Effects of Opioid Impairment on Motor Vehicle Crashes, Injury Severity, and Hospital Charges
Abstract:	Opioid addiction has been a disruptive and destructive force loosed upon American lives for years now. Yet instead of ameliorating new data show 2020 was the worst year on record, with a 30% increase in drug overdose deaths (CDC, 2021). Early 2021 saw Congress allocate \$1.5 billion to battle the American opioid epidemic. Still, the toll of opioid impairment while behind the wheel of a motor vehicle is not yet well understood. Funded by a grant from the Centers for Disease Control and Prevention, the Illinois Department of Public Health in collaboration with the Illinois Department of Transportation and the University of Illinois Springfield successfully linked Illinois crash and hospital records for the years 2016 through 2018. Some 213,321 linked records were used to investigate the effects of opioid impairment on crash injury severity and resulting hospital charges.
Manuscript Classifications:	Safety; Impairment in Transportation ACS50; Impaired Driving
Manuscript Number:	
Article Type:	Presentation
Order of Authors:	Mickey Edwards, Ph.D., M.P.A., B.S. Daniel Leonard, M.S.
Additional Information:	
Question	Response
The total word count limit is 7500 words including tables. Each table equals 250 words and must be included in your count. Papers exceeding the word limit may be rejected. My word count is:	500

45 **Results:**

46

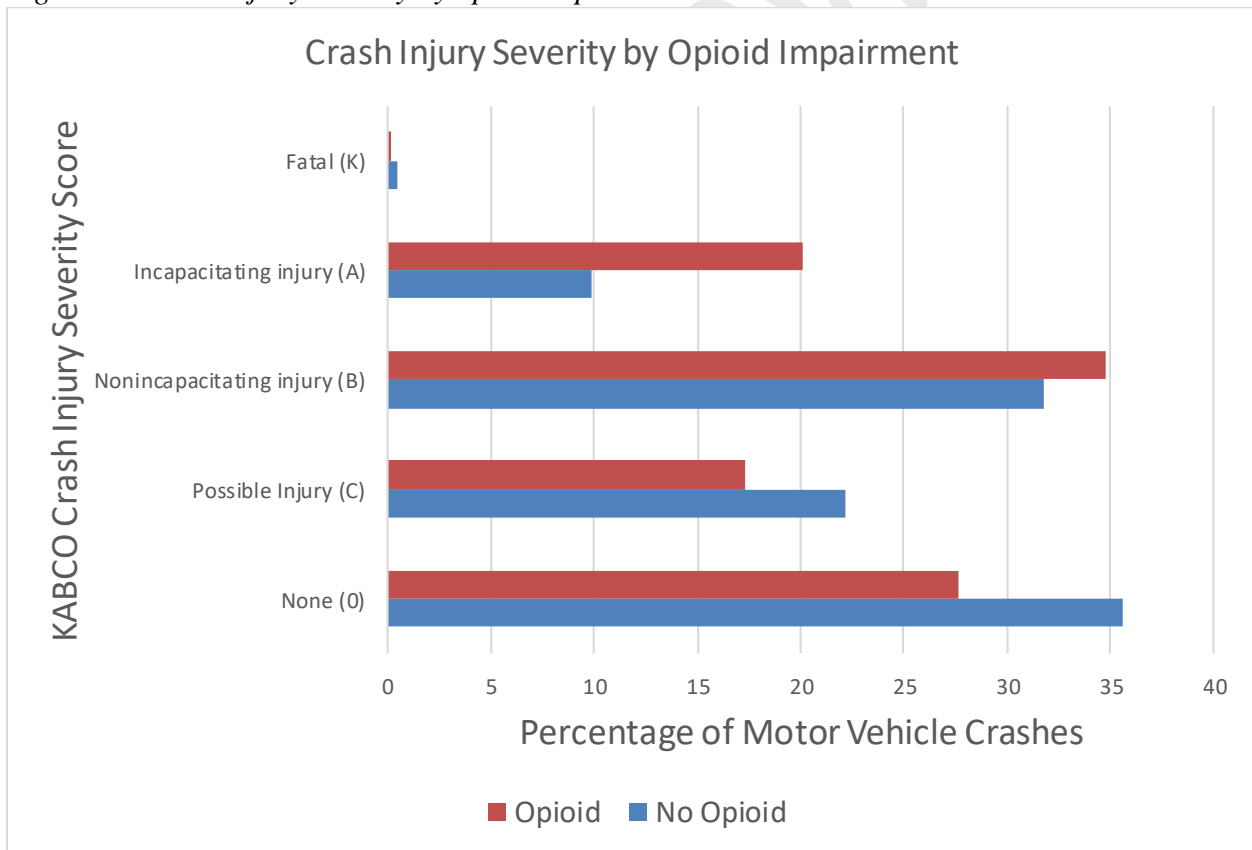
47 The analysis reveals 1,217 motor vehicle crashes in which at least one driver was diagnosed at
48 the hospital as positive for opioids. Two of those opioid-positive crashes resulted in fatalities,
49 one urban and one rural, neither victim was among the impaired. For comparison with other
50 hospital substance diagnoses, cocaine was associated with 599 crashes and six fatalities;
51 cannabis with 1,425 crashes and three fatalities; stimulants with 139 crashes and one fatality;
52 hallucinogens with 66 crashes and zero fatalities; and unspecified substances with 499 crashes
53 and two fatalities. Nearly 14% of drivers impaired by opioids were also diagnosed with multiple
54 substances present; cocaine and cannabis tied as the prevalent other substances.

55

56 Crashes involving opioid impairment resulted in significantly more severe crash injuries even if,
57 strangely, a smaller proportion of fatalities (Figure 1). Victims of non-opioid crashes were eight
58 percentage points more likely to walk away uninjured compared to those in opioid related
59 crashes; they were also more likely to sustain only minor injuries. Opioid related crash victims
60 were ten, and three, percentage points more likely to sustain more severe incapacitating injuries,
61 or non-incapacitating injuries, respectively.

62

63 *Figure 1: Crash injury severity by opioid impairment*



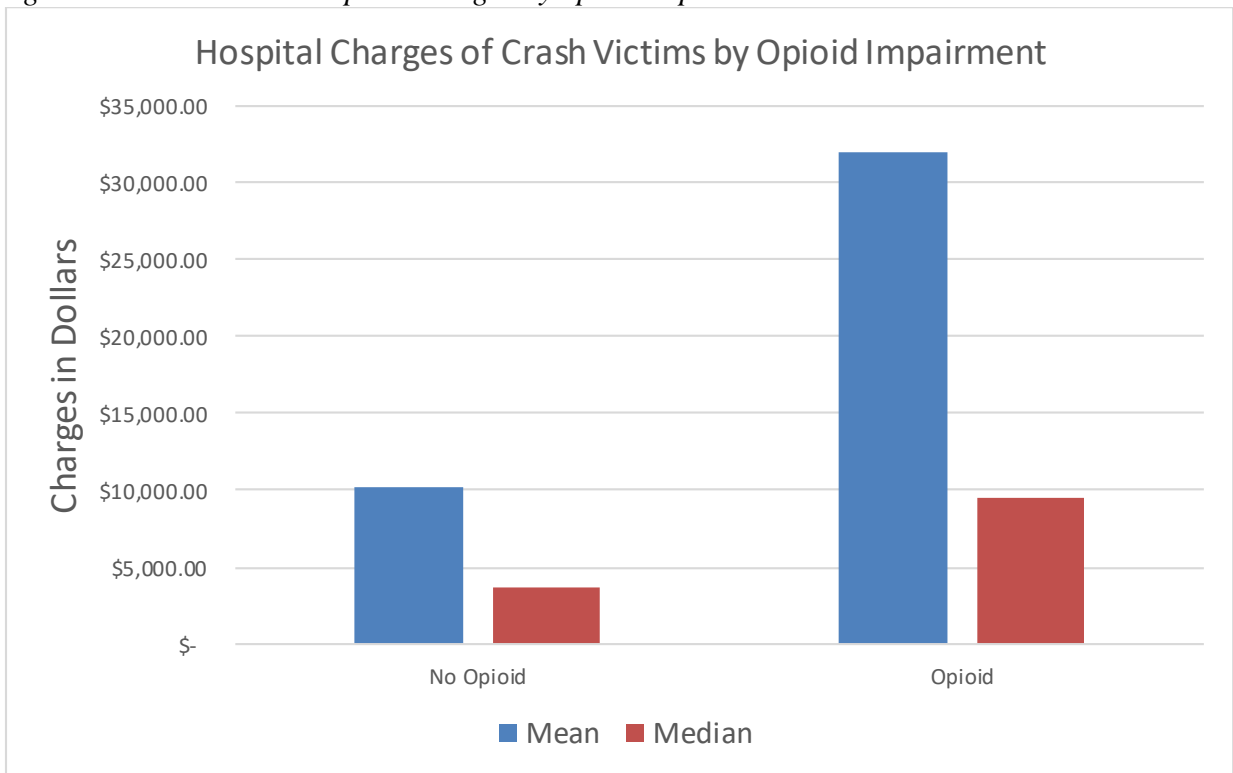
64

65

66 Crash victims involved in opioid cases had much higher hospital charges (Figure 2). Both the
67 mean and median charges were about three times that of victims in crashes not involving opioid
68 impairment. For opioid related crash victims the mean hospital charge was about \$32k,

69 compared to \$10.2k for non-opioid related crash victims. Median charges tell a similar story at
70 \$3.7k for non-opioid and \$9.5k for opioid related crashes.

71
72 *Figure 2: Crash victim hospital charges by opioid impairment*



73
74
75
76 **Discussion:**

77
78 This analysis demonstrates yet another dimension of opioid’s destructive force. Still, a
79 significant gap persists between suspected substance impairment reported by police and hospital
80 substance diagnoses. Only 389 cases involving substances were both suspected by police and
81 diagnosed. Some 997 cases were suspected and not diagnosed, and 2,917 were diagnosed but not
82 suspected. Among positive diagnoses, 27% contained multiple substances. Better testing and
83 reporting would improve our understanding of the true toll taken by opioid, and other substances,
84 impairment on our communities.

85
86 **References:**

87
88 Ahmad FB, Rossen LM, Sutton P. Provisional drug overdose death counts. National Center for
89 Health Statistics. 2021.

90
91 **DISCLAIMER:** This research was supported by the National Center for Injury Prevention and
92 Control of the Centers for Disease Prevention and Control (CDC) under award number CE16-
93 1602. The content is solely the responsibility of the authors and does not necessarily represent
94 the official views of the CDC.