

## Q&As: Cellphones, texting, and driving

January 2010

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### 1 | How many people use cellphones?

Cellphone use in the United States has grown quickly during the past decade. There were more than 276 million wireless cellphone subscribers as of June 2009, according to the Cellular Telecommunications and Internet Association.<sup>1</sup> That's up 42 percent from 194 million in June 2005 and nearly three times more than the 97 million wireless subscribers in June 2000. Minutes of use have surged to more than 1.1 trillion in June 2008 from 195 billion in June 2000.

### 2 | Do drivers frequently use phones behind the wheel?

Yes, though it's hard to determine accurately just how many drivers use phones. Observational data from the federal government indicate that 6 percent of drivers in 2008 were using hand-held phones at any moment during the day. This means about 812,000 passenger vehicles on the road at any moment during the day were driven by people talking on hand-held phones. Based on drivers' self-reported phone use, the government estimates that 11 percent of drivers were using any kind of phones at any moment during the day in 2008.<sup>2</sup> Phone use by drivers has increased dramatically. In 2000, 3 percent of drivers were observed talking on hand-held phones, and an estimated 4 percent were using any kind of phone.<sup>3</sup>

### 3 | Who is most likely to talk on a cellphone while driving?

Female drivers more frequently use hand-held cellphones than male drivers (8 percent vs. 5 percent), according to daytime observational surveys of drivers conducted nationwide in 2008. Young drivers ages 16-24 also are more likely than other drivers to talk on hand-held cellphones. Eight percent of drivers ages 16-24 were observed talking on hand-held phones, compared with 6 percent of those ages 25-69 and 1 percent of drivers 70 and older. Use rates of talking on hand-held phones also varied by region, ranging from 4 percent in the Northeast to 7 percent in the South and West. Use was lower on weekends (4 percent) than on weekdays (7 percent).<sup>2</sup>

### 4 | Does using a cellphone while driving increase crash risk?

Yes. Two controlled studies link talking on a cellphone directly to increased crash risk. A 2005 Institute study of drivers in Western Australia found cellphone users four times as likely to get into crashes serious enough to injure themselves.<sup>4</sup> The study used cellphone billing records to verify phone use of crash-involved drivers. Increased risk was similar for males and females, drivers younger than 30 and those 30 and older, and hands-free and hand-held phones. The findings were consistent with 1997 research that showed phone use among Canadian drivers was associated with a fourfold increase in the risk of a property damage crash. This study also used cellphone billing records to verify phone use of drivers.<sup>5</sup>

### 5 | Are hands-free cellphones safer?

No, at least not after the conversation begins. Both studies of crashes using cellphone billing records to verify phone use found about a fourfold increase in crash risk with conversing on both hands-free and hand-held phones.<sup>4,5</sup> The studies were unable to estimate crash risk from different types of hands-free devices. They also were unable to determine whether there was any benefit associated with hands-free devices while placing the call. Experimental research using driving simulators indicates that phone conversation tasks, whether using hand-held or hands-free devices, affect some measures of driving performance.<sup>6,7</sup> Hands-free phones may eliminate some of the physical distraction of handling phones, but the cognitive distraction from phone conversations remains.

### 6 | How does cellphone use affect driving performance?

An Institute review of more than 120 cellphone studies, about half of which were experimental studies using driving simulators or instrumented vehicles, found that nearly all reported that some measures of driver performance were affected by the cognitive distractions associated with cellphone tasks.<sup>7</sup> Phone conversation tasks typically increased

reaction times and travel speeds and increased lane deviations and steering wheel movements. Statistical analyses that aggregated the results of 33 studies and 23 studies, respectively, reported similar findings.<sup>6,8</sup> Some studies have found that older drivers' performance is more affected by cellphone tasks, particularly their reaction time. Few studies included drivers younger than 18, and evidence is mixed on the effects of phone use for teenage drivers compared with adult drivers. Findings also are mixed on whether driving performance while talking on a cellphone improves with practice. Some simulator studies suggest that the negative impact of phone use on driving performance may lessen with experience.<sup>9,10</sup> Other simulator research has found no change in performance with practice.<sup>11</sup>

Using functional magnetic resonance imaging, researchers at Carnegie Mellon University found a 37 percent reduction in brain activity associated with driving when research subjects listened via a headset to spoken sentences that they judged as true or false while steering in a driving simulator. Researchers concluded that listening and processing information from a phone conversation can draw mental resources away from driving, worsening driving performance, even when drivers are not holding or dialing a phone.<sup>12</sup>

Further evidence comes from a few studies of small samples of people observed during their everyday driving. One study included drivers of 100 vehicles instrumented with video cameras and other monitoring technologies. Only a few serious crashes occurred, but researchers calculated the odds of being in a near-crash or crash were 2.8 times higher when dialing a hand-held phone than when phones weren't being used. The odds of a near-crash or crash were 1.3 times higher when talking on a hand-held phone, although this was not statistically significant. But because drivers spend more time talking on a hand-held phone than dialing, the percentage of crashes and near-crashes estimated to be attributable to talking and dialing on hand-held phones were both about 4 percent.<sup>13</sup>

#### 7 | Are government restrictions on drivers' cellphone use common?

Not in the US, but bans are widespread in other countries. Seven states (California, Connecticut, New Jersey, New York, Oregon, Utah, and Washington) and the District of Columbia have enacted laws that ban drivers of all ages from using hand-held cellphones. More common in the US are laws that restrict young drivers from using any type of cellphone. Teenage drivers in 21 states and the District of Columbia are barred from talking on any type of cellphone. School bus drivers in 17 states and the District of Columbia are restricted from using all cellphones while driving a bus. A number of jurisdictions world-wide including Australia, Japan, most European countries, and several Canadian provinces ban hand-held phones while driving.

Text messaging is banned for all drivers in 19 states and the District of Columbia. In addition, novice drivers are banned from texting in 9 states (Delaware, Indiana, Kansas, Maine, Mississippi, Missouri, Nebraska, Texas, and West Virginia), and school bus drivers are banned from text messaging in 1 state (Texas).

Cellphone laws in the US

#### 8 | Do bans on hand-held phones work?

Their effect on crashes hasn't been determined, but Institute studies have documented how bans enacted in the US have affected driver hand-held cellphone use.<sup>14</sup> In November 2001, New York became the first state to implement a ban on hand-held cellphones for drivers. Driver hand-held cellphone use declined by an estimated 47 percent immediately after the ban. Use then began going back up, but when measured more than 7 years after the ban, use was 24 percent lower than would have been expected without the ban. Soon after a ban was passed in the District of Columbia in 2004, driver hand-held phone use dropped by 41 percent. Nearly five years after the ban, the rate of phone use was 43 percent lower than would have been expected without a ban. Connecticut's ban took effect in 2005. Hand-held phone use declined an estimated 76 percent immediately after a ban; more than 3 years later, use was 65 percent lower than would be expected without a ban.

In the 15 months after laws took effect, compliance in New York was lower than in DC, and the difference appeared due to more intensive enforcement in DC.<sup>14</sup> However, this linkage is no longer clear because enforcement in New York has picked up such that levels of enforcement in 2008 appeared comparable in DC and New York, whereas enforcement in Connecticut lagged behind. In all of the jurisdictions, the likelihood that a driver violating the ban would receive a citation was low, and there were no publicized targeted enforcement campaigns in any of the three jurisdictions.<sup>14</sup>

Although this research demonstrates that bans on hand-held phoning while driving can have big and long-term effects, the safety effects aren't clear. Many drivers still use hand-held phones where use is banned, and other drivers may simply switch to hands-free phones. Given that crash risk increases substantially with drivers' use of either hand-held or hands-free phones, bans on hand-held cellphones won't eliminate the problem entirely. Laws prohibiting hands-free phones are difficult to enforce.

**9 | Why do more laws cover only teenage drivers?**

Cellphone bans for young drivers are becoming more common amid concerns about the role distractions play in teenagers' elevated crash risk. Distractions of any type are a common factor in crashes of newly licensed 16-year-old drivers.<sup>15</sup> Some research also shows teenage drivers tend to use cellphones and other emerging technologies more than adult drivers.<sup>16</sup> States increasingly have graduated licensing laws that place restrictions on newly licensed drivers, e.g., limiting nighttime driving and the number of passengers a novice driver can carry. Cellphone bans are being added to those restrictions.

See Q&A: Teenagers — graduated driver licensing

More about the licensing law in your state, or any state

**10 | Do teenagers comply with cellphone bans?**

Young drivers often ignore cellphone restrictions, according to an Institute study of North Carolina's cellphone ban for young beginning drivers. The state bans the use of any telecommunications device by drivers younger than 18 under its graduated licensing system. Observed cellphone use by teenagers leaving high schools in the afternoon changed little from 1-2 months before and 5 months after the restriction took effect on Dec. 1, 2006.<sup>17</sup> About 11 percent of teenage drivers were seen using phones before the law. That percentage rose slightly to 12 percent in the postlaw survey. Cellphone use remained steady at about 13 percent at comparison sites in South Carolina, which doesn't restrict teenage drivers' phone use. When observed postlaw, less than 1 percent of teenage drivers in North Carolina were using hands-free phones. About 2 percent were observed dialing or texting and about 9 percent were holding a phone to their ear.

The study coupled driver observations with telephone surveys of North Carolina parents and their teenagers. In postlaw surveys, about two-thirds of teenagers said they knew about their state's law, compared with 39 percent of parents. Three-quarters of teenagers and 95 percent of parents said they approved of the law. The proportion of teenagers who reported using phones while driving declined somewhat following the law. However, of those who owned a phone and admitted to ever talking on the phone while driving, about half admitted they used their phones, if they had driven, on the day prior to the interview. There was no evidence of focused enforcement or publicity of the law. Only 22 percent of teenagers and 13 percent of parents believed the ban was being enforced fairly often or a lot.<sup>17</sup>

**11 | Is cellphone use more distracting to drivers than other tasks?**

Evidence is mixed. For example, some experimental studies found that phone conversations are more disruptive than conversations with passengers or adjusting a radio.<sup>7</sup> However, two statistical analyses combining the results of multiple experimental studies found similar decrements in reaction time for conversation tasks with passengers and with hand-held or hands-free phones.<sup>6,8</sup> Two studies reported that talking on cellphones or having a 0.08 percent blood alcohol concentration (BAC) — the legal threshold for impairment — has a comparable effect on some simulated driving tasks.<sup>18,19</sup> However, the risks associated with alcohol impairment accumulate over the entire duration of a trip, whereas the risks of cellphone use generally apply for only a portion of a trip. In addition, crash risk increases substantially at very high BACs, and the implications of the experimental studies for drivers in their own vehicles is unknown.

**12 | Is texting while driving a problem?**

Over 600 billion text messages were sent in 2008. This is up nearly 4 times from the number sent in 2006, according to the Cellular Telecommunications and Internet Association.<sup>1</sup> Many people report that they text while driving. A 2008 telephone survey by Nationwide Insurance found that 18 percent of people who own cellphones send or read text messages when driving, and among drivers 30 and younger the proportion jumps to nearly 40 percent.<sup>20</sup>

There hasn't been a lot of research on texting and driving, but two studies of young drivers using driving simulators all found that receiving, and especially sending, text messages led to decrements in driving behavior, particularly reaction time and lane keeping ability.<sup>21,22</sup> In a study involving large trucks instrumented with video cameras and other monitoring technology, the odds of a traffic conflict, lane drift, near-crash, or crash were 23 times higher when a truck driver was texting. A limitation is that less than 1 percent of the incidents involved crashes; most were lane drifts or other driver errors. It's unknown how such incidents relate to actual crashes. It also is unclear whether the results generalize to passenger vehicle drivers.<sup>23</sup>

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