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Crash rates over time among younger and older drivers in the SHRP 2 naturalistic driving study

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ABSTRACT

Objective: To examine crash rates over time among 16–17-year-old drivers compared to older drivers. *Methods:* Data were from a random sample of 854 of the 3,500 study participants in SHRP 2, a U.S. national, naturalistic driving (instrumented vehicle) study. Crashes/10,000 miles by driver age group, 3-month period, and sex were examined within generalized linear mixed models. *Results:* Analyses of individual differences between age cohorts indicated higher incidence rates in the 16–17-year old cohort relative to older age groups each of the first four quarters (except the first quarter compared to 18–20 year old drivers) with incident rate ratios (IRR) ranging from 1.98 to 18.90, and for the full study period compared with drivers 18–20 (IRR = 1.69, CI = 1.00, 2.86), 21 to 25 (IRR = 2.27, CI = 1.31, 3.91), and 35 to 55 (IRR = 4.00, CI = 2.28, 7.03). Within the 16–17-year old cohort no differences were found in rates among males and females and the decline in rates over the 24-month study period was not significant. *Conclusions:* The prolonged period of elevated crash rates suggests the need to enhance novice young driver prevention approaches such as Graduated Driver's Licensing limits, parent restrictions, and post-licensure supervision and monitoring. *Practical Applications*: Increases are needed in Graduated Driver's Licensing limits, parent restrictions, and postlicensure supervision and monitoring.

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Crash rates are higher among U.S. adolescents than older drivers (NHTSA, 2014) and decline with experience (Chapman, Masten, & Browning, 2014; Curry, Metzger, Williams, & Tefft, 2017). Young age appears to exacerbate the effect of inexperience (Chapman et al., 2014; Twisk & Stacey, 2007), likely due to characteristics of adolescent development (Dahl, 2008) that contribute to poor judgment (Simons-Morton & Ehsani, 2016), inattention and distraction (Klauer et al., 2013), susceptibility to social influences (Ouimet et al., 2015; Simons-Morton et al., 2014), and risk taking (Curry, Hafetz, Kallan, Winston, & Durbin, 2011; Mirman, Albert, Jacobsohn, & Winston, 2012; Ouimet et al., 2014).

It appears that the skills and judgment required for safe driving develop mainly through experience. Therefore, novices need to drive to gain safe driving capabilities, but the absolute crash risk increases as a function of miles driven (Elvik, 2006). Fortunately, not all driving is equally risky and Graduated Driver's Licensing (GDL) policies that limit novice teenage drivers' early exposure to higher-risk conditions (such as driving late at night and/or with multiple teenage passengers) have proven effective (Chen, Baker, & Li, 2006; Foss, 2007; Williams, Tefft, & Grabowski, 2012). Nonetheless, young drivers remain at a high crash risk for a period of time after licensure, even when relatively strict GDL policies are in place (Curry et al., 2017; Gershon et al., 2017). This is not surprising since expertise for any complex psycho-motor task requires sophisticated judgement skills that improve mainly with practice (MacNamara, Moreau, & Hambrick, 2016; Simons-Morton &

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Ehsani, 2016). The gradual ascendance of fully automated vehicles is expected to reduce crash rates in general and diminish age disparities, but this evolution is expected to take a decade or even two decades to play out (NHTSA, 2017). Because young drivers tend to drive older vehicles (Williams, Leaf, Simons-Morton, & Hartos, 2006), they may be one of the last groups to benefit from such advances in vehicle safety technology. Hence, novices could remain one of the most vulnerable groups of drivers for the foreseeable future. Improvements in young driver safety during this period depend on developing a better understanding of novice teen driving risks (Simons-Morton & Ehsani, 2016).

Analyses of national data based on police reports have consistently documented higher crash rates among 16–20-year old than older drivers (NHTSA, 2014). Early self-report (McCartt, Shabanova, & Leaf, 2003; Twisk & Stacey, 2007) and crash record studies (Mayhew, Simpson, & Pak, 2003) indicated that crash rates were higher among novices than experienced drivers for about 6-months after licensure, but few cohort studies have been conducted.

In a recent state-level cohort study, Chapman et al. (2014) found that crash rates per 10,000 California licensed drivers ages 16–20 were higher than the referent group of 25–35-year old drivers the entire study period of 2–3 years. However, since Chapman and colleagues did not measure exposure, it is not known if this finding is affected by variability in the amounts of driving of drivers in different age groups. Crash rates of those licensed at age 16 declined significantly after 25–36 months, while rates of those licensed at age 17 declined after 13–24 months, and those licensed at 18 declined after 7–12 months. Curry et al. (2017) analyzed linked New Jersey licensing and crash data and found that rates among 17-year-old novices in New Jersey were higher the first month after licensure than rates among novices licensed at 18, 19, or 20 years. Crash rates declined for about 6 months among novices of each age, but more steeply for the youngest at licensure.

The two state-level cohort studies just described provide important new information on the extent and duration of higher crash rate of novices at licensure, although each employed somewhat different methods leading to different conclusions about the extent and persistence of novice crash rates. Notably, Chapman et al. (2014) compared rates in 3-month periods from the time of licensure among 16- and 17-years old drivers licensed under GDL compared to 18, 19, 20, 21–24, and 25–35-year old drivers who were not subject to the same California GDL policies. Curry et al. (2017) looked at monthly rates over time of New Jersey drivers licensed at ages 17–20. While it seems clear that novices have higher crash rates than older drivers, it is not clear how long this disparity persists. Additional information is needed on national crash rates based on miles driven to allow unbiased comparisons between young and older drivers over time.

Naturalistic driving studies use extensive instrumentation installed in vehicles to record crashes and mileage on the same individuals over time, allowing the calculation of crash rates per miles driven (Dingus et al., 2016). Relative to rates based on drivers of a certain age, exposure-based rates allow comparisons between younger and older drivers unbiased by different amounts these groups drive, which is generally less mileage among younger than older drivers. The Second Strategic Highway Research Program (SHRP2) Naturalistic Driving Study is the largest study of its type ever conducted, with extensive data on real world driving in multiple regions of the United States from more than 3,500 participants aged 16–98 assessed for up to 24 months (Dingus et al., 2015). Previous analyses of SHRP 2 data indicated a higher rate for all crashes and rear-end crashes among 16–19-year-old drivers compared with adult drivers (Seacrist et al., 2016) and higher rates of secondary-task-related crashes among 16–20-year-old drivers than for older drivers (Guo et al., 2017). The SHRP 2 data provide the opportunity to examine crash rates over time among novice 16–17-year-old drivers compared to older drivers.

The purpose of this research is to examine the variability in crash rates per miles driven by driver age and sex over time. Based on the limited research on the topic as reviewed above, the expected outcomes include higher crash rates among younger than older drivers that decline over the study period.

1. Methods

1.1. Design and participants

SHRP2 collected comprehensive data on real world driving from more than 3,500 licensed volunteers aged 16–98 from six regional centers (Buffalo, NY; Tampa, FL; Seattle, WA; Durham, NC; Bloomington, IN; and State College, PA) recruited through flyers, posters, personal contacts in schools and parent groups, and advertisements in newspapers, TV, radio, Facebook, traffic websites, and state DOT/MVA offices. Identical twins were excluded from participation (Dingus et al., 2015). The current analyses included all 16–17-year-old drivers (n = 254) equitably representing the six sites and random samples of 200 drivers from each of three other age groups, 18 –20, 21 –25, and 35 –55; each group included nearly the same number of males and females from each site. Per the SHRP 2 protocol, at recruitment study participants were asked to participate for at least 12 months and at each 6-month contact they were invited to extend their participation. Date of licensure was obtained by participant self-report. Consent was obtained from adult participants and both parent consent and teen assent were obtained for participants <18-years old. Participants were compensated $300 per study year.

1.2. Vehicle instrumentation and data security

Participants' private vehicles were equipped with a data acquisition system (DAS), which continuously collected and stored video and sensor information. DAS capabilities included accelerometers, global positioning system (GPS), multiple camera views (which recorded video and still photos of forward roadway, driver's face, right rearview, and driver interactions with steering wheel and center console), and vehicle network data (as available). The data were encrypted on-board the vehicle and remained encrypted until the data from the vehicle hard drive was downloaded and stored on protected servers at Virginia Tech according to the study protocol and procedures approved by the Virginia Tech Institutional Review Board. Data were post-processed on a secure server in a data reduction and coding laboratory.

1.3. Measures

1.3.1. Demographic and experience measures

At recruitment, participants completed surveys that indicated sex, age, age at licensure, driving experience in months, and annual miles driven.

1.3.2. Trip measures

Experienced coders with extensive training viewed the video clips of each recorded trip (measured as ignition on to ignition off) and identified the driver and trip conditions including passengers, ambient light, and weather conditions.

1.3.3. Crashes

Crashes were identified by filtering the data from each g-force event $\geq$0.65 and coding the video footage before and after the event (Dingus et al., 2015, 2016). Rates were calculated based on mileage obtained from GPS and vehicle sensors (Dingus et al., 2016). The analysis presented here include crashes coded according to type and severity as follows: Level 1 (airbag, injury, rollover); Level 2 (property damage $\geq$ $1,500); and Level 3 (physical contact with other object or roadway departure; minimal or no damage) (24).

1.4. Analyses

Crash incidence rates (IR) per 10,000 miles were calculated for each age group for crash levels 1–3 combined. Differences in crash incidence rates over time among age cohorts were examined using Generalized Linear Mixed Models for Poisson distribution with logarithm link (fixed effects = time period, sex, age at licensure, driving experience; random effect = intercept of individual driver crash rates) (Johnston & So, 2003). Time period was characterized by the rate for each participant in the age group who drove that period. An important advantage of GLIMMIX is that it accounts for all participants who provided data during each time period, thus providing accurate information on age group variability each time period. This is a useful analytic approach when participation varied over time in each age group, but more in some age groups than others, as in our case, thereby controlling for possible bias in the analyses due to dropout differences. We report the F tests for the overall models, but the primary comparisons of interest are the random effects over time because each time period is not independent of the previous time period. Therefore, the estimated (modeled) rates and confidence intervals are based on the overall random effects, which provide incidence rates. Incidence rate differences between age cohorts were expressed as incidence rate ratios (IRRs) with 95% confidence intervals. For the analyses comparing among 16–17-year old drivers change in the rate from the first quarter, age, driving experience, and license age were included in the model.

2. Results

2.1. Study participation

Of the 845 participants, 665 (78.7%) provided data through 12 months, 306 (36.2%) for 18 months, and 154 (18.2%) for 24 months. At recruitment average participant ages were 17.1 years with 1.3 years of driving experience (including supervised practice driving during the permit period) for the 16–17-year old group; 19.2 years with 3.1 years of driving experience for the 18–20-year old group; 23.2 with 6.9 years of driving experience for the 21–25-year old group; and 45.4 years with an average of 28.3 years of driving experience for the 35–55-year old group. Participation rates did not differ by age group.

2.2. Crash incidence rates by age, time period, sex, and severity

Shown in Table 1 are the descriptive (raw) crash incident rates per 10,000 miles by age and 3-month period. Crash incidence rates for the full study period of 24 months were higher for the 16–17-year old drivers (IR = 0.95, CI = 0.72, 1.18), than the 18–20-year old group (IR = 0.50, CI = 0.35, 0.65), the 21–25-year old group (IR = 0.37, CI = 0.24, 0.49), and the 35–55-year old group (IR = 0.17, CI = 0.10, 0.25).

Crash rates were lower among those in the study 12 months or more compared with those in the study less than 12 months (OR = 1.5; CI = 1.38, 8.33) [data not shown]. We examined possible differences by age group by comparing crash rates the first 3-months of shorter (<9 months) and longer (>12 months) participation. Accordingly, for the 16–17-year old group rates were 0.85 and 0.96; for the 18–20-year old group rates were 0.83 and 0.31; for the 21–25-year old group rates were 0.44 and 0.20; and for the 35–55-year old group rates were 0.08 and 0.39. Hence, for the 18–20 and 21–25 groups, longer-duration participants had lower rates than shorter-duration participants, which could somewhat inflate comparisons with the youngest age group.

As shown in Table 2, crash incidence rates for the 16–17-year old drivers were not significantly lower among female drivers at any period or for the full study period (IR = 0.89, CI = 0.62, 1.15) compared to male drivers (IR = 1.03, CI = 0.64, 1.42).

2.3. Differences by age cohort

To compare rates by age group and to assess change over time we modeled the incidence rates per 3-month period by age cohort. Comparisons between age groups (cohorts) in GLIMMIX (Type III fixed effects) indicated significant age group differences in crash rates over the full study period ($F = 8.11$, $df = 3$, 3,363, $p < 0.001$) and 3-month period ($F = 3.02$, $df = 7$, 3,363, $p = 0.0038$), but the interaction between age group and period was not significant. Incidence rates derived from GLIMMIX are presented by age and 3-month period in Fig. 1; note the higher mean incidence rates for 16–17-year old drivers and the extreme variability in this age group each quarter relative to the other age groups. The incidence rate ratios (IRR's) comparing crash incidence rates of 16–17-year old drivers to all other drivers age group for each period are shown in Table 3. Accordingly, there were higher rates for 16–17-year old drivers for each other age group for each of the first 4 quarters (except for the 18–19-year old group the first quarter), IRRs ranging from 1.98 to >18.9. For the full study period the IRRs indicate that the rate for the youngest driver cohort was 1.69 times higher than the rate for the 18–20-year old cohort, 2.27 times higher than the rate for the 21–25-year old cohort, and 4.00 times higher than the rate for the 35–55-year old cohort.

2.4. Analyses of change over time in the 16–17-old group

For the 16–17-year old cohort we examined change over time, comparing the incidence rate and 95% confidence intervals the first 3-month period with rate each subsequent period controlling for sex and driving experience. The main effects of month ($F = 1.31$, $df = 7$, 948, p = 0.24), sex ($F = 0.11$, $df = 1$, 948, $p = 0.74$), and driving experience ($F = 0.01$, $df = 1$, 948, $p < 0.99$) and the interaction between time (3-month periods) and sex were not significant. The Incident Rate Ratios shown in Table 4 indicate non-significant declines (non-significant increase in the 4th quarter) from the first to each subsequent 3-month period.

3. Discussion

The study presents crash rates over time for four age groups of drivers from the SHRP 2 Naturalistic Driving Study with a primary focus on the 16–17-year-old novice driver group, whose rates would be expected to be highest, with the most within-group variability, and decline with experience. Accordingly, incidence rates were higher among 16–17-year olds versus older groups (except versus the 18–20-year age group the first 3-month period) each of the first four 3-month periods and higher on average over the full study period than older age groups. These age group differences, however, could be inflated somewhat due to differential participation among the 18–20 and 21–25 age groups, where higher risk drivers, relative to lower risk drivers, were less likely to participate for the full study period. Our finding of significantly higher rates in the 16–17-year old group for 12 months was less than the period of at least 24-months (compared to 25–35-year old drivers) reported by Chapman et al. (2014), but longer than the 6-months generally assumed (Mayhew et al., 2003).

Table 1
Crash incidence rates (raw, unadjusted) and 95% confidence intervals per 10,000 miles for 3-month periods and 24 months for each of four age groups sampled from SHRP 2.

Age Group	Months	*N* (# Drivers)	Total Miles	# Crashes	Incidence Rates	LCL	UCL
16–17	0–3	254	404,099	39	1.38	0.46	2.29
	4–6	245	359,348	32	0.92	0.48	1.36
	7–9	225	344,568	21	1.05	0.29	1.82
	10–12	201	289,053	32	0.89	0.51	1.27
	13–15	143	193,985	10	0.51	0.11	0.92
	16–18	91	111,112	10	1.45	−0.28	3.19
	19–21	48	66,905	4	0.48	−0.08	1.03
	22–24	31	22,284	1	0.10	−0.10	0.30
	0–24	254	1,791,353	149	0.95	0.72	1.18
18–20	0–3	201	440,841	29	0.57	0.33	0.82
	4–6	187	372,150	16	1.91	−0.99	4.81
	7–9	176	357,423	9	0.32	0.07	0.57
	10–12	154	264,317	10	0.46	0.17	0.75
	13–15	109	188,460	9	1.69	−0.86	4.25
	16–18	81	161,258	6	0.47	0.04	0.90
	19–21	58	107,070	3	0.26	−0.05	0.56
	22–24	38	41,438	1	0.15	−0.14	0.43
	0–24	201	1,932,957	83	0.50	0.35	0.65
21–25	0–3	199	527,513	19	0.35	0.17	0.54
	4–6	193	473,177	25	0.53	0.30	0.77
	7–9	178	460,916	10	0.21	0.05	0.36
	10–12	148	376,863	13	0.31	0.07	0.55
	13–15	104	228,216	8	0.34	0.03	0.65
	16–18	71	172,352	7	0.22	0.02	0.42
	19–21	55	121,583	1	0.04	−0.04	0.11
	22–24	54	84,363	2	1.12	−0.97	3.21
	0–24	199	2,444,984	85	0.37	0.24	0.49
35–55	0–3	200	486,435	14	0.31	0.09	0.54
	4–6	193	458,897	2	0.02	−0.01	0.06
	7–9	173	400,600	2	0.03	−0.01	0.06
	10–12	162	354,152	10	0.31	0.08	0.55
	13–15	138	191,539	3	0.04	−0.02	0.10
	16–18	63	153,731	5	0.18	−0.09	0.45
	19–21	54	139,551	3	0.43	−0.12	0.97
	22–24	31	242,834	8	0.26	0.04	0.49
	0–24	200	2,427,739	47	0.17	0.10	0.25

Table 2
Crash incidence rates per 10,000 miles (95% CI) per 3-month and 24-month periods among 16 to 17-year old drivers sampled from SHRP2.

Gender	Months	# Drivers	Total Miles	# Crashes	Incidence Rates	LCL	UCL
Female	0–3	136	209,282	18	1.45	−0.18	3.07
	4–6	129	180,420	17	0.99	0.46	1.53
	7–9	120	175,789	14	0.82	0.32	1.32
	10–12	110	147,781	20	0.96	0.38	1.54
	13–15	74	103,934	6	0.33	0.03	0.63
	16–18	54	57,333	5	0.56	−0.01	1.12
	19–21	27	34,238	1	0.12	−0.12	0.36
	22–24	19	9,944	0	0.00	0.00	0.00
	0–24	136	918,720	81	0.89	0.62	1.15
Male	0–3	117	191,815	21	1.31	0.67	1.94
	4–6	115	177,923	15	0.85	0.14	1.57
	7–9	104	167,764	7	1.33	−0.22	2.89
	10–12	90	140,176	12	0.81	0.34	1.28
	13–15	68	87,440	4	0.72	−0.07	1.51
	16–18	36	53,249	5	2.84	−1.46	7.15
	19–21	20	32,625	3	0.98	−0.30	2.26
	22–24	12	12,340	1	0.26	−0.25	0.78
	0–24	117	863,331	68	1.03	0.64	1.42

Next, we sought to determine how long before crash rates in the 16–17-year old group declined by comparing the rate the first period with the rate at each subsequent period. We found substantial variability at each 3-month interval, but no decline over the 24-month period. This finding is unlikely to have been due to differential participation because crash rates did not vary significantly among the 16–17-year old drivers who were in the study for longer compared to shorter duration. This finding is longer than reported in previous naturalistic driving cohort studies for crash/near crash rates, one that reported a significant decline after nine-months post-licensure (Simons-Morton et al., 2011), and one reporting no decline over the 12-month study period (Gershon et al., 2017). Also, this finding is consistent with Chapman et al. (2014), who reported declines among drivers licensed at age 16 after 24-months and drivers licensed at age 17 after 12-months. As in our study, Chapman et al. analyses considered 3-month periods, but our study reported crash incidence rates per miles driven, while Chapman et al. reported rates per driver. Curry et al. (2017) reported rapid declines in crashes per licensed driver over the first 6 months of licensure among drivers newly licensed at ages 17, 18,

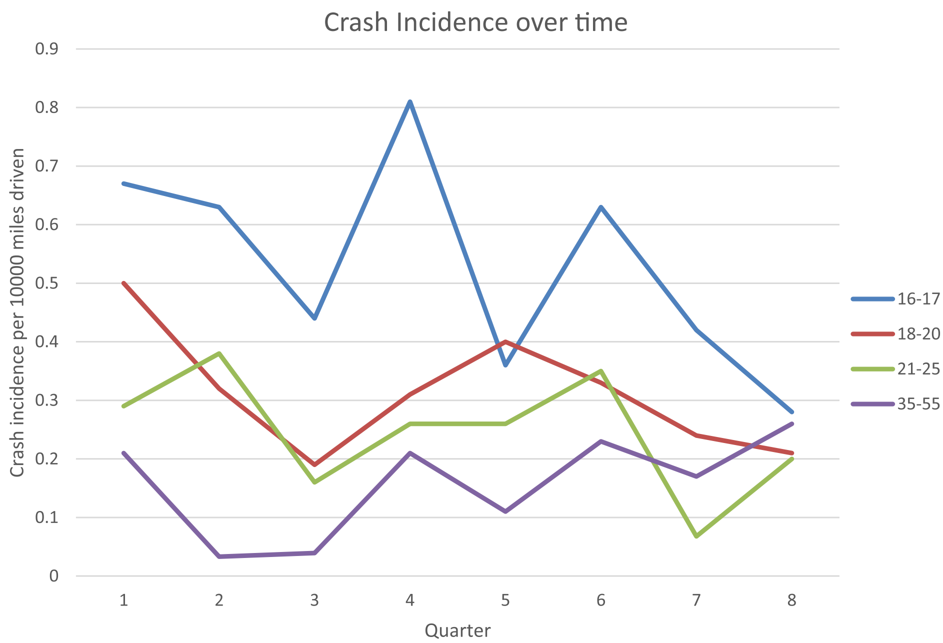

Fig. 1. Crash incidence rates and 95% confidence intervals per 10,000 miles for 3-month study periods for four age groups sampled from SHRP 2 (adjusted rates based on GLIMMIX).

Table 3
Crash incidence rate ratios (IRRs)* and 95% confidence intervals comparing rates of 16–17-year old group with rates of older groups each 3-month period.

Period	16–17 vs 18–20			16–17 vs 21–25			16–17 vs 35–55		
	IRR	LCL	UCL	IRR	LCL	UCL	IRR	LCL	UCL
Q1: 1–3 mo	1.35	0.79	2.30	**2.32**	**1.27**	**4.22**	**3.22**	**1.64**	**6.31**
Q2: 4–6 mo	**1.98**	**1.04**	**3.79**	1.64	0.91	2.95	**18.90**	**4.44**	**80.87**
Q3: 7–9 mo	**2.32**	**1.02**	**5.27**	**2.74**	**1.23**	**6.09**	**11.19**	**2.56**	**48.92**
Q4: 10–12 mo	**2.64**	**1.24**	**5.60**	**3.19**	**1.58**	**6.46**	**4.94**	**1.82**	**8.50**
Q5: 13–15 mo	0.90	0.35	2.32	1.38	0.53	3.71	3.41	0.89	13.04
Q6: 16–18 mo	1.91	0.66	5.54	1.80	0.65	5.02	2.72	0.87	8.51
Q7: 19–21 mo	1.81	0.39	8.46	6.24	0.67	58.12	2.49	0.53	11.82
Q8: 22–24 mo	1.30	0.08	22.12	1.35	0.11	15.88	1.07	0.13	9.12
Q1-8: 1–24 mo	**1.69**	**1.00**	**2.86**	**2.27**	**1.31**	**3.91**	**4.00**	**2.28**	**7.03**

Notes: Based on General Linear Mixed Models for Poisson distribution; mo = month.
Bold indicates 95% confidence intervals do not overlap 1.0.

Table 4
Crash incident rate ratios for the 16–17-year old cohort sampled from SHRP 2 comparing the first 3-month period with each subsequent 3-month period, adjusted for participant age and age at licensure.

Period	Incident Rate Ratios and 95% Confidence Intervals		
	IRR	LCL	UCL
Q1: 1–3 mo	–	–	–
Q2: 4–6 mo	0.92	0.58	1.47
Q3: 7–9 mo	0.64	0.37	1.09
Q4: 10–12 mo	1.18	0.73	1.89
Q5: 13–15 mo	0.53	0.26	1.07
Q6: 16–18 mo	0.92	0.45	1.87
Q7: 19–21 mo	0.61	0.21	1.74
Q8: 22–24 mo	0.41	0.06	3.07

19, and 20, but a higher initial rate and more rapid decline in the 17-year old drivers. Notably, Chapman et al. examined rates from the time of licensure among 16-year old drivers, and Curry et al. examined time from licensure among 17-year old drivers, where in our study we reported rates among 16–17-year old drivers from enrollment in the study, adjusted for age of licensure. Chapman and Curry were able to examine rates from the exact time of licensure, while 16–17-year old participants in our study reported that they were licensed within 6-month increments, age 16–16.5, 16.5–17, and 17 –17.5.

Strengths of the study include objective (video-observed) assessment of crash events in a national sample of drivers of different ages and driving experience followed for 24 months, providing evidence of the variability in crash rates between age groups and within the 16–17-year old group over time. However, the study is not without limitations. Not all participants participated the full 24-month study period and those who participated for longer periods had lower crash rates than those who participated for shorter periods, suggesting the possibility that more risky drivers may have been more likely not to continue than less risky drivers. Also, we did not obtain exact dates of licensure.

Study limitations notwithstanding, our finding that rates for novice drivers remained elevated relative to older drivers and did not decline over the study period is consistent with the substantial research on the development of expertise suggesting that the judgment required for safe driving performance develops gradually over many months of experience (Simons-Morton & Ehsani, 2016).

4. Conclusion

Our findings indicate that crash rates among 16–17-year old drivers were higher than rates for older drivers for at least

12-months, highly variable at each 3-month interval, but did not decline over the study period. It is tempting to imagine that the novice young driver problem will soon be solved by automating vehicles, but even if the technology were available and reliable today (at present autonomous vehicle sensors do not work adequately under all driving conditions), it would be a decade or more before fully-automated vehicles could replace the current fleet of manually-operated vehicles. The high rates and extreme variability among young novices suggests the following: (a) the need to identify factors associated with the variability in risk in this age group; (b) at least until there is better identification of high risk groups and characteristics, it would be best to apply population-oriented prevention approaches that address newly licensed drivers in general, rather than specific high-risk groups. Indeed, the prolonged period of elevated risk suggests the need to strengthen, improve, and innovate with respect to prevention policy and practices to reduce young driver crash risk, including unique combinations of the following: (a) additional or more strict GDL limits, including possibly extending the provisions to cover older novices; (b) greater parental involvement in teen driving, including parent limits on driving exposure; (c) feedback on driving behavior to teen drivers and their parents from instruments added to the vehicle; and (d) additional pre-licensure training focusing on independent driving behavior and risk.

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