

Teens have the highest crash rate of any group in the United States.



Young Driver Licensing in New Jersey: Rates and Trends, 2006-2011

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Title

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Brief Summary

Introduction

Recent nationally-representative surveys have provided important insight on the primary reasons why US teens delay licensure, but are limited in their ability to estimate licensure rates and trends. State-level administrative licensing data are the ideal data source to provide this information, but they have not yet been analyzed for this purpose. Our objective was to analyze New Jersey's (NJ) licensing database to: (1) describe population-based rates of licensure among 17- to 20-year-olds, overall and by gender and zip code level indicators of household income, population density, and race/ethnicity; and (2) examine trends in licensure from 2006 through 2011. The research presented here was conducted as a part of a larger study that is examining the effects of age and experience on crash rates among New Jersey drivers licensed at older versus younger ages.

Methods

We obtained records on all individuals who obtained a NJ driver's license through June 2012 from the NJ Motor Vehicle Commission's licensing database, and determined each young driver's age at the time of intermediate and full licensure. Residence address zip codes were categorized into quintiles for relevant socioeconomic indicators. Data from the US Census and 2011 American Community Survey were used to construct population denominators and specifically to define a fixed cohort of NJ residents who turned 17 years old in 2006–2007 (n=255,833). Licensure data were used to determine the number of drivers who turned 17 years old in 2006–2007 and obtained an intermediate license by each month of age (numerators) and, among those who obtained an intermediate license, time to graduation to full licensure. Licensing rates were estimated for the overall NJ population, as well as by gender and by quintiles of zip code level indicators for household income, population density, and race/ethnicity. Finally, we estimated licensure rates separately for annual cohorts of 17-year-olds from 2006 through 2011.

Results

Forty percent of all residents—and half of those who ultimately obtained a license by age 21—were licensed within a month of NJ's minimum licensing age of 17. In all, 64 percent of teens were licensed by their 18th birthday, 74 percent by their 19th birthday, 78 percent by their 20th birthday, and 81 percent by their 21st birthday. Further, the younger an individual obtained his or her intermediate license, the earlier he or she graduated to a full license. Licensing rates were slightly higher for females than males, but we observed starkly different patterns of licensure by socioeconomic zip code level indicators. For example, 65 percent of 17-year-olds residing in the highest-income zip codes were licensed in the first month of eligibility, compared with 13 percent of residents living in the lowest-income zip codes. Finally, the rate and timing of licensure in NJ has been relatively stable from 2006 through 2011, with at most a one to three percentage point decline in rates over this period.

Implications

NJ has the highest minimum licensing age in the US and is the only state in which Graduated Driver Licensing (GDL) requirements apply to 18- to 20-year-old drivers. These results provide a unique perspective from a state whose GDL system has long been hailed as a model and informs stakeholders in other states as they consider raising their minimum licensing age and/or extending GDL restrictions to older novice drivers. Our findings also support the growing body of literature suggesting that teens delay licensure primarily for economic reasons and that a substantial proportion of potentially high-risk teens may be obtaining licenses outside the auspices of a GDL system. Finally, the trend in licensure from 2006 through 2011 was relatively stable, in contrast to recent national-level reports of a substantial decline in licensure rates.

Introduction

Prior studies have established the effectiveness of US Graduated Driver Licensing (GDL) systems in reducing the incidence of crashes among young novice drivers, as well as the benefit of a higher minimum licensing age.¹⁻³ However, GDL programs in almost all US states include novice drivers only up to age 18. Some (but not all) recent GDL evaluations have reported higher fatal crash rates among 18-year-old drivers,^{2,4-6} raising the issue that certain subgroups of teens may be delaying the onset of licensure to an age at which they are no longer covered by their state's GDL system. The young driver research community is beginning to delve into this issue and its potential implications, and an important step in doing so is to gain a better understanding of licensure patterns among US teens and how these patterns vary among subgroups.

Several recent nationally-representative surveys have estimated driver licensing rates among teens. In 2010, the annual Monitoring the Future (MTF) survey estimated that 73 percent of US high school seniors reported having a driver's license.⁷ In a separate survey of 1,039 18- to 20-year-olds conducted by the AAA Foundation for Traffic Safety in 2011, 65 percent of 18-year-olds, 70 percent of 19-year-olds, and 76 percent of 20-year-olds reported being licensed.⁸ Studies differ in terms of whether rates vary by gender,⁷⁻⁹ but lower rates were noted among Hispanics and African-Americans compared with whites,^{7,9,10} those with lower income,⁸ and those residing in denser urban areas compared with less dense urban areas.¹¹

The specific timing of licensure and how that has changed in recent years is largely unknown, with only two recent surveys examining this question. Tefft *et al.* found that only 44 percent of teens were licensed within one year of their state's minimum licensing age,⁸ while McCartt *et al.* conducted interviews in three states (RI, NC, MN) with 16- and 17-year-olds who presented to DMVs to take their on-road driving test, and found that most teens obtained their license within two months of eligibility.¹²

Although the general perception is that licensure rates have declined in the US—in particular in the late 2000s coinciding with the economic recession—in truth, few studies have assessed trends.¹³ The only survey to do so showed a 12 percentage point decline in the number of licensed high school seniors from 1996 to 2010 (85% to 73%), with two-thirds of that decline occurring between 2006 and 2010. Notably, these reports were based on the

single question “*Do you have a driver’s license?*” and traversed the time period in which states implemented GDL systems, adding to the possibility of different interpretations of the term “driver’s license.” In addition, a Highway Loss Data Institute (HLDI) study showed that the level of insured teens declined between 2006 and 2012.¹⁴

Several reasons have been posited regarding why US teens delay licensure, including to avoid GDL system requirements,⁵ an increased ability to connect virtually with friends,¹⁵ and the availability of alternative transportation systems.¹¹ Recent studies, however, provide evidence that teens delay licensure primarily for economic and practical reasons. Teens reported not having a car, the cost of gas or maintaining a vehicle, being able to get around without driving, and being busy with other activities as main reasons for not obtaining a license, while fewer mentioned their state’s laws or virtual connectivity with friends.^{8,16} These results, combined with findings of delayed licensure among minority and lower-income teens and the HLDI’s finding that unemployment was a significant factor in the decline of insured teens,^{8,14} warrant further investigation of the role of socioeconomic factors on licensing rates.

Although surveys have provided important insight on the reasons for delayed licensure, they have significant limitations in estimating licensing rates. Their cross-sectional nature precludes assessment of trends, national studies do not always account for differences in minimum licensing ages across states and may include respondents from only a fraction of states, sample sizes may preclude examination of subgroup differences, and teens may have to recall age at licensure. Further, cumulative proportions of time to licensure estimated by McCartt *et al.* were conditional on 16- and 17-year-olds having presented at the DMV for a road test—that is, rates were estimated among 16- or 17-year-olds seeking licensure instead of the entire population of 16- and 17-year-olds (the denominator of interest).¹²

Analysis of population-level licensure data would overcome the above-mentioned limitations and complement in-depth surveys by providing information on the timing of and trends in teens’ licensure. Thus far, only aggregate data provided by the Federal Highway Administration (FHWA) has been used to provide population-level licensure estimates. Using FHWA data, Sivak and Schoettle reported that 76 percent of US 19-year-olds were licensed in 2008 and that by 2010 the proportion had declined to 70 percent.¹⁷ However, serious concerns have been raised about the validity of FHWA data, and large year-to-year fluctuations in the number of licensed 16-year-olds have been reported in FHWA data for at least a dozen states.^{18,19}

State-level administrative licensing data serve as the ideal source for population-based data on licensing but have not yet been analyzed for this purpose. To this end, we aimed to utilize New Jersey’s (NJ) state licensing database to describe population-based rates of licensure among 17- to 20-year-olds. New Jersey is unique in that its minimum licensure age of 17 is the highest of any US state, and it is the only state for which full GDL requirements apply to all newly-licensed drivers under 21 years of age. While this limits the immediate generalizability to other states, it does provide a unique perspective from a state whose GDL system has long been hailed as a model, and informs stakeholders in other states as they consider raising their minimum licensing age and/or extending GDL restrictions to older novice drivers.²⁰ In addition, these analyses serve as an illustration of the types of data that may be extracted from state licensing databases to further advance young driver research. Specifically, our objectives were to: (1) determine the proportion of

NJ residents who obtain an initial (intermediate) license by each month of age (17 through 20), both overall and by gender and zip code level indicators of household income, population density, and race/ethnicity; (2) describe rates of graduation from intermediate to full licensure; and (3) examine trends in licensure rates from 2006 through 2011.

Methods

New Jersey GDL System

New Jersey has one of the most comprehensive GDL laws in the US (enacted in 2001), with the highest minimum age of licensure, and one of the lowest teen crash fatality rates.³ Adolescents progress through three licensing phases:

- (1) *Learner's permit*: eligible at a minimum age of 16 (17 if no formal driver training) and 180-day minimum holding period;
- (2) *Intermediate license (known as probationary in NJ)*: eligible at a minimum of age 17, 365-day minimum holding period, and subject to the following restrictions:
 - (a) one-passenger limit unless a parent/guardian is in the vehicle;
 - (b) ban on driving from 11:01 p.m. through 4:59 a.m.;
 - (c) ban on driver use of hand held and hands-free interactive wireless communication devices; and
 - (d) required seat belt use for all vehicle occupants; and
- (3) *Full (basic) license*: eligible at a minimum of age 18 following completion of phases 1 and 2.

NJ is the only state that applies full GDL rules to all newly-licensed drivers under age 21; in other states, newly-licensed drivers aged 18 and older are exempt from GDL restrictions.²¹ Note that graduation to a NJ full license is not automatic after 365 days; drivers remain in the intermediate license phase until they present to a NJ Motor Vehicle Commission to transition to a full license.

New Jersey Licensing Database

We obtained detailed records on all individuals who obtained a NJ driver's license through June 2012 from the NJ Motor Vehicle Commission's (MVC) Licensing and Registration Database. The database includes key data elements related to each driver's progression through the state's licensing process, including exact date of birth, start dates of the permit and intermediate license phases, date of death, and type and date of all license-related transactions (i.e., initial, renewal, duplicate, change, upgrade, downgrade). We used these data elements to construct each driver's exact age at the time of intermediate and full licensure. While the exact date of intermediate licensure was available, no specific variable indicated the start date of the full license. Given that the minimum holding period for an intermediate license is 365 days, we defined the start date of the full license period as the date of the earliest license-related transaction (excluding downgrades and duplicates) that occurred at least 365 days after the date that the intermediate period began.

Census Data

To construct population denominators, we obtained from the US Census the estimated number of 17-year-old NJ residents in each year 2006 through 2011.^{22,23} Zip code level population estimates were available from the 2011 American Community Survey (ACS), but only for a five-year time period (2007-2011) and for 15- to 19-year-olds combined.²⁴ To estimate the number of 17-year-olds residing in each NJ zip code, we first used 2007-2011 Census population estimates to determine that 17-year-olds accounted for 21.2 percent of NJ's population of 15- to 19-year-olds; we then applied this proportion to ACS zip code level 15- to 19-year-old estimates. Finally, we used the 2011 ACS and 2010 Census Gazetteer Files to categorize NJ zip codes into the following quintiles:

Categories	Quintiles				
	1	2	3	4	5
Income (median household)	≤\$57,226	\$57,227 – \$72,857	\$72,858 – \$87,222	\$87,223 – \$105,888	≥\$105,889
Population Density (people per square mile)	≤408.6	408.7 – 1223.6	1223.7 – 2615.8	2615.9 – 4876.8	≥4876.9
Racial Distribution (% of residents who are non-Hispanic white)	≤20.9%	21.0% – 65.5%	65.6% – 80.1%	80.2% – 88.8%	≥88.9%

It is important to note that New Jersey is a highly urbanized state—it has the highest population density and ranks third in median household income.²⁵⁻²⁷

Study Population and Analysis

The primary aim of this study was to longitudinally describe population-level licensing rates among 17- to 20-year-old NJ residents. Our study population of interest was a fixed cohort of NJ residents who turned 17 years old in 2006–2007. We defined this population as the combined 2006-2007 Census estimate of 17-year-old residents in NJ (n=255,833)²² and assumed a stable rate of NJ teens entering and exiting their 17th year of life. These specific years were selected for two reasons: (1) to ensure complete follow-up through age 20 for each member of the study population, and (2) we discovered during our data management process that available data on license phase was not valid for 19- and 20-year-old drivers prior to 2006 due to a series of changes to the structure of NJ's licensing database. Licensure data was used to determine the number of drivers who turned 17 in 2006–2007 and obtained an intermediate license by each month of age (numerators). Finally, we estimated age-specific licensing rates—that is, the proportion of NJ residents who turned 17 in 2006–2007 that obtained a license at each month of age. Rates were further stratified by gender and by quintiles of zip code level indicators for household income, population

density, and race/ethnicity. We use specific notation to indicate age at licensure: for example, licensure at 17 years and 0 months old will be notated as “17y0m” and represent those who were licensed between their 17th birthday and one day prior to the same day in the subsequent month.

Analyses of graduation to full licensure were further restricted to individuals who turned 17 years old in 2006 and who obtained an intermediate license before age 20. This was to ensure we had sufficient data to follow drivers with intermediate licenses for *at least* 12 months after they were eligible to graduate to a full license—i.e., at least 24 months after intermediate licensure. Follow-up time was defined as the number of months since a driver became eligible to graduate to full licensure. The first month of eligibility was calculated as the period spanning from 365 days after date of intermediate licensure to one day prior to the same day in the subsequent month—e.g., for an individual licensed on January 15, 2006, the first month of eligibility includes the period from January 15, 2007 through February 14, 2007. Individuals who died during the 24 months after intermediate licensure without having graduated to a full license were excluded from these analyses.

Finally, we examined licensing trends over time by estimating intermediate licensure rates separately for annual cohorts of 17-year-olds from 2006 through 2011. To estimate licensure rates among NJ residents who turned 17 years old in 2006, for example, we used the number of residents who turned 17 years old in 2006 (estimated from the Census) as the denominator and the number of drivers who turned 17 years old in 2006 and obtained an intermediate license by each of the specified ages as the numerators.

Results

Intermediate Licensure

Figure 1 (Appendix) depicts the proportion of teens licensed during each month of age from 17 through 20 years old; cumulative proportions are shown for all drivers and separately for each gender. Overall, 40 percent of all residents—and 49 percent of those who ultimately obtained a license by age 21—were licensed in their first month of eligibility (17y0m). Three percent or less were licensed in each subsequent month with the exception of 17y6m (5.2%), the minimum licensing age for those who did not complete formal driver training. In all, 64 percent of teens were licensed by their 18th birthday, 74 percent by their 19th birthday, 78 percent by their 20th birthday, and 81 percent by their 21st birthday. The median age at licensure for those who obtained their license by their 21st birthday was 17.1 (interquartile range [IQR]: 17.0, 17.9). Licensing rates were slightly higher for females than males, with 41 percent of females and 38 percent of males licensed in their first month of eligibility, and 82 percent of females and 80 percent of males licensed by their 21st birthday.

Graduation to Full Licensure

Among those who turned 17 years old in 2006 and obtained an intermediate license before age 20, we determined the proportion that had graduated to full licensure by each month of eligibility. As shown in Figure 2 (Appendix), graduation rates varied by age at intermediate licensure. In general, the younger an individual obtained their intermediate license, the more likely they were to graduate to a full license immediately upon being eligible to do so.

While 42 percent of teens who obtained their intermediate license in the first month of eligibility (17y0m) also graduated to their full license within the first month of eligibility (i.e., at 18y0m), only 18 percent of teens licensed at 18 years old and 15 percent of teens licensed at 19 years old graduated to a full license as soon as they were eligible. At 12-months post-eligibility (i.e., 24-months after intermediate licensure), 76 percent of drivers licensed at 17y0m, 65 percent of drivers licensed at 17y1m – 17y5m, 58 percent of drivers licensed at 17y6m – 17y11m, and 50 percent of drivers licensed at 18 or 19 years old had graduated to a full license.

Licensure Rate by Zip Code Level Indicators

We observed substantial variations when we estimated licensure rates within populations defined by quintiles of zip code level indicators. The proportion of residents licensed in their first month of eligibility was much higher in high-income areas (Figure 3, Appendix); 65 percent of 17-year-olds residing in the highest-income zip codes were licensed in the first month of eligibility compared with 13 percent of residents living in the lowest-income zip codes. By 18 years old, the proportion licensed increased to 87 percent in the highest-income areas but only to 36 percent in the lowest-income areas. By age 21, 39 percent of residents in low-income areas had yet to be licensed. Similar trends were observed when zip codes were categorized by population density and racial distribution, although the difference was less pronounced for population density (Figures 4 and 5, Appendix).

Regarding graduation to full licensure, the proportion of drivers who transitioned in their first month of eligibility was higher for males than females (34% vs. 29%, respectively) and for those living in higher-income areas (36% in highest-income areas vs. 22% in lowest-income areas) (Figures 6 and 7, Appendix). After 12 months of eligibility (24 months post-intermediate licensure), 27 percent of those in the highest-income areas and 44 percent in the lowest-income areas still had not graduated to a full license.

Trends in Initial Licensure, 2006-2011

Finally, we estimated the proportion of NJ residents who obtained their intermediate license separately for yearly cohorts 2006 through 2011. For later cohorts, the end of the study period occurred before all cohort members reached the specified birthdays; incomplete follow-up is indicated with grey boxes. Over the study period there was at most a one to three percentage point decline in the percent of NJ teens who obtained their intermediate license (Table 1). In addition, the average monthly number of newly-issued NJ intermediate licenses did not appear to change appreciably over time (Table 2). Finally, the median age at intermediate licensure (among those licensed by age 21) was the same in 2006 and 2012 (17.1, IQR: 17.0, 17.8).

Table 1. Proportion of NJ residents obtaining their intermediate license by specified ages, by year of 17th birthday.

Year of 17 th birthday	Proportion of NJ teens obtaining intermediate license by...														
	17y0m			18 th birthday			19 th birthday			20 th birthday			21 st birthday		
	All	M	F	All	M	F	All	M	F	All	M	F	All	M	F
2006	40	39	42	65	64	66	75	75	75	79	79	80	82	82	83
2007	39	37	41	64	63	65	73	72	74	78	77	78	80	79	81
2008	39	38	41	63	63	64	73	72	74	77	77	78			
2009	39	37	41	64	63	65	73	73	74						
2010	38	37	40	63	62	64									
2011	39	37	41												

Table 2. Mean number of NJ intermediate licenses issued per month to NJ 17- to 20-year-olds, by year.

Year	Mean
2006	8409
2007	8653
2008	8628
2009	8500
2010	8257
2011	8449
Jan-Jun 2012	8440

Discussion

This study utilized state-level administrative licensing data to describe the licensing trajectory of a cohort of young NJ residents as they became eligible for licensure. Of NJ residents who became eligible for licensure (i.e., turned 17 years old) in 2006 or 2007, 40 percent—and half of those ultimately licensed by age 21—obtained a license in the first month they were eligible. However, a notably different picture emerges when licensing rates are estimated within varying sociodemographic strata. Among residents living in NJ's highest-income zip codes, 65 percent are licensed immediately upon turning 17, and 78 percent are licensed within six months. Conversely, only 13 percent of those in the lowest-income areas are licensed in their first month of eligibility; six months later, only 19 percent are licensed. While almost all residents in the highest-income areas are licensed by age 21, one in three residents in the lowest-income areas are not licensed by 21. Finally, contrary to reports of significant national declines in licensure, our results indicate that the rate and timing of licensure in NJ have been relatively stable since 2006.

Although results of this study aren't directly comparable to previous cross-sectional surveys of national samples given that NJ's minimum licensing age is higher than all other US states, they do provide a glimpse of what licensing patterns may look like under a higher minimum licensing age. Our finding that 64 percent of all teens are licensed by one year post-eligibility is higher than the AAA Foundation's national estimate of 44 percent.⁸ This may suggest that, compared with other states, NJ teens may get licensed at a quicker rate once they are able to do so, perhaps in part due to the older age at which they begin the process. Indeed, Preusser *et al.* reported similar results in a 1993 survey of teens in high schools in NJ, CT, NY, and DE; by 17 years and 2 months, the rate of licensing in NJ had surpassed rates in NY and CT, both of which had minimum licensing ages of 16 years and 7 months.²⁸ Interestingly, our age-specific estimates of the proportion of NJ teens licensed are only a few percentage points lower than the rate reported in a survey of 10,237 NJ high school students conducted by Williams *et al.* over 30 years ago,²⁹ suggesting that NJ's GDL implementation has not substantially altered its patterns of licensure (proportion of 17-year-olds licensed: 67% in 1983, 64% in 2006–2007; proportion of 18-year-olds licensed: 77% in 1983, 74% in 2006–2007).

Our findings support the growing body of literature suggesting that teens' delay of licensure is related primarily to socioeconomic factors. In addition to the vastly different licensing rates by socioeconomic status found in this study and the AAA Foundation for Traffic Safety's national survey,⁸ we also previously reported much lower rates of formal driver education among minority teens in the US.³⁰ Findings in this study may be partly attributable to the fact that NJ teens who do not complete formal driver education are eligible for licensure six months later (at 17y6m) than those who do. On a national scale, the findings of higher licensing ages and lower rates of formal driver training among minorities and those of lower socioeconomic status may have important safety implications. In all states except NJ, newly-licensed 18- to 20-year-old drivers are not subject to full GDL requirements. Tefft *et al.* estimated that 75 percent of US drivers with a household income <\$20,000 are licensed after their 18th birthday,⁸ suggesting that a substantial proportion of low-income or minority young drivers^{31–33}—who may already have higher rates of risky driving behaviors and crashes—are becoming licensed outside the auspices of a GDL system. This may help to partly explain findings that, in contrast to white and African-American drivers, GDL did not significantly affect the fatal crash rate of young Hispanic drivers.³⁴ Further, this may indicate a potential benefit of extending GDL requirements to 18- to 20-year-old novice drivers.

As Williams noted,²⁰ several states have recently considered raising their minimum licensing ages, although no such legislation has passed. NJ teens and their parents have recently expressed strong support both for NJ's licensing policies and its minimum licensing age,³⁵ although NJ is a highly urbanized state and certainly has better access to other modes of transportation than might exist in more rural states. However, even in national samples, the majority of parents of 15- to 18-year-olds and 18- to 20-year-olds supported a minimum licensing age of 17 years old or higher.^{8,10}

Our study is meant to serve as a high-level description of licensing rates among NJ teens. Individual-level income and race were not collected, and thus results depicting licensing rates by zip code level indicators should not be interpreted as an investigation of the contribution of individual-level sociodemographic factors on time to licensure. Further, zip code level indicators were moderately correlated (range of correlation coefficients: -.53 to .43); our study

was not designed to assess the independent effects of these indicators. In addition, we were not able to account for migration out of NJ of individuals who turned 17 years old in 2006-2007; a resident of NJ who left the state before licensure would be accounted for in Census denominator but not in licensing data, leading to an underestimation of the licensure rate. Individuals who moved into NJ with a full license from another state are not included in the numerator or denominator. Finally, each driver's zip code of residence reflects their address at the time it was last updated with the NJ Motor Vehicle Commission (as of June 2012), which is not necessarily the same as it was at the time of licensure. However, the vast majority of drivers included in our study either had only one address since licensure (67%) or had multiple addresses that were all in the same zip code quintile (23%).

Conclusion

Our study is unique in its use of state-level administrative licensing data to describe licensing patterns over the course of adolescence and over calendar time. Overall, more than three in four NJ residents were licensed by age 21, and half of those who obtained a license by age 21 did so immediately upon turning 17 years old. Although licensure rates did not differ greatly for males and females, starkly different patterns of licensure were observed by socioeconomic areas. There may be important safety implications nationally if a substantial proportion of low-income and/or minority teens is licensed between 18 and 20 years old, when GDL programs no longer apply. Finally, in contrast to recent national-level reports of a substantial decline in licensure rates, the rate of licensure in NJ has been relatively stable (one to three percentage point decline) from 2006 through 2011.

State licensing data provides valuable information that, in conjunction with results from in-depth surveys, advances our understanding of US driver licensing patterns. In addition, licensing data allows for estimation of per-driver crash rates and for examination of young driver rates by level of experience instead of relying on age as a proxy.

A forthcoming AAA Foundation report will build on the information presented here to investigate the independent and combined effect of age and experience on crash rates among NJ's young drivers licensed at older versus younger ages.

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Appendix – Figures 1-7

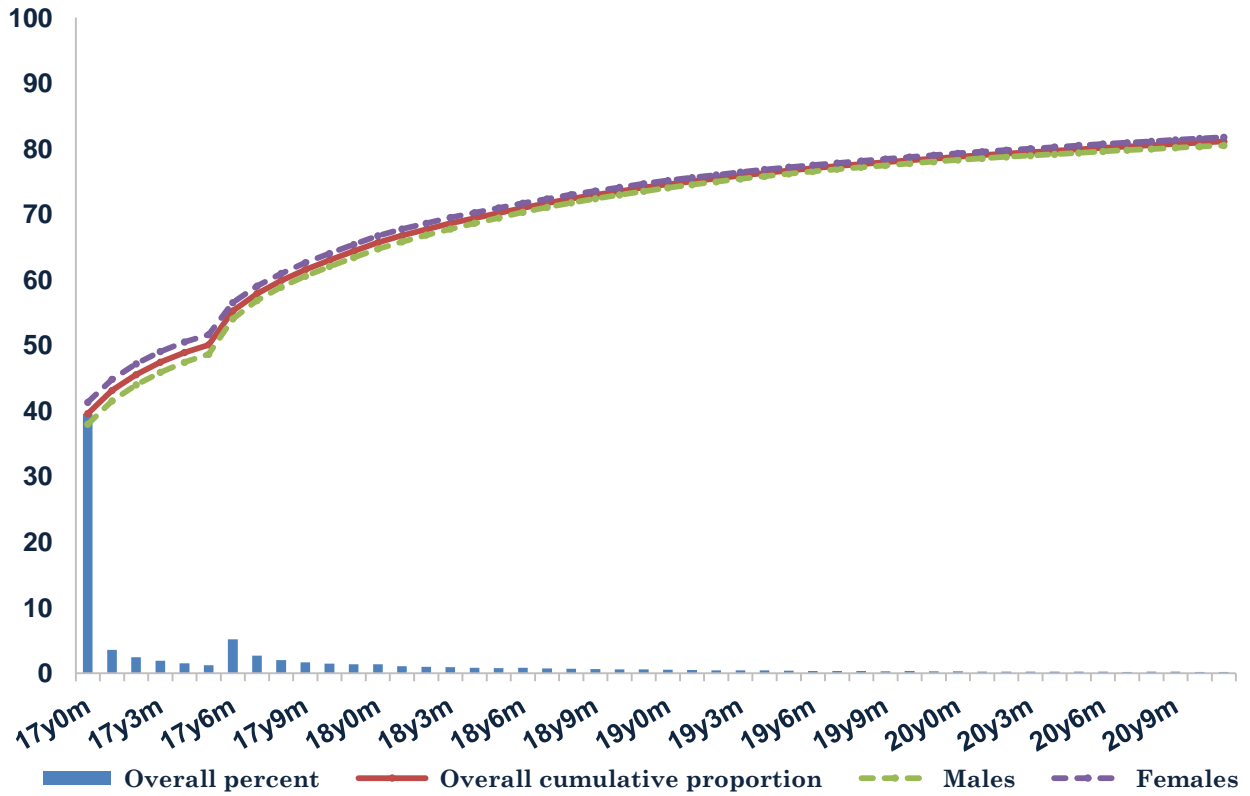


Figure 1. Percent and cumulative proportion of residents obtaining a NJ intermediate license by each month of age, among those who turned 17 years old in 2006-2007.

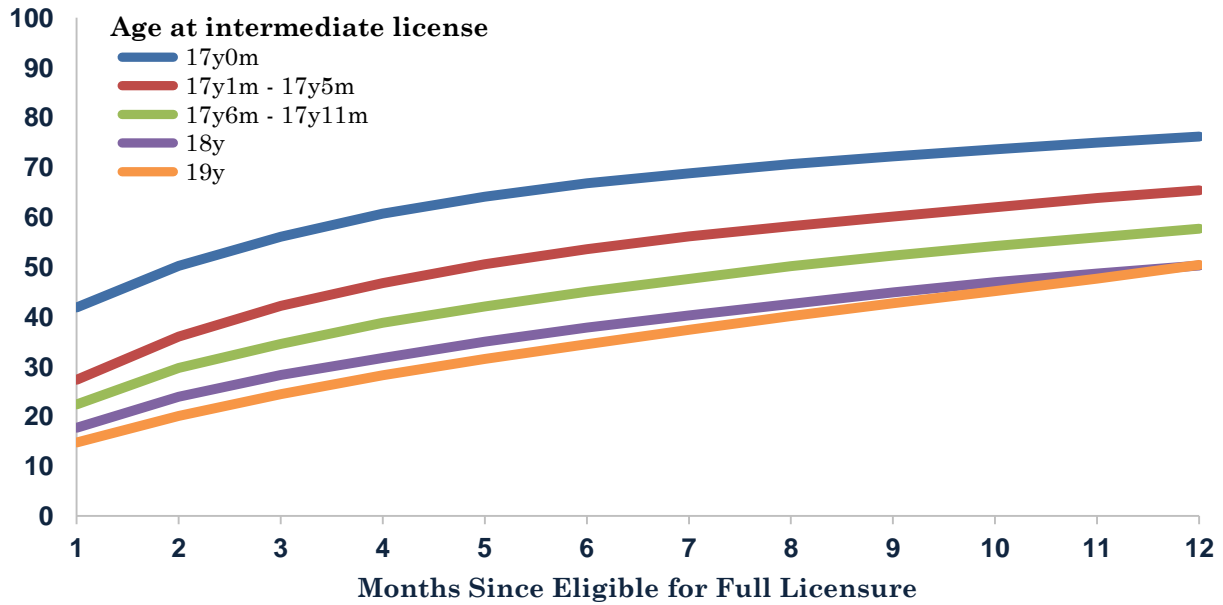


Figure 2. Proportion of drivers with a NJ intermediate license who obtained their full license at each month of eligibility, by age at intermediate licensure, among those who turned 17 years old in 2006.

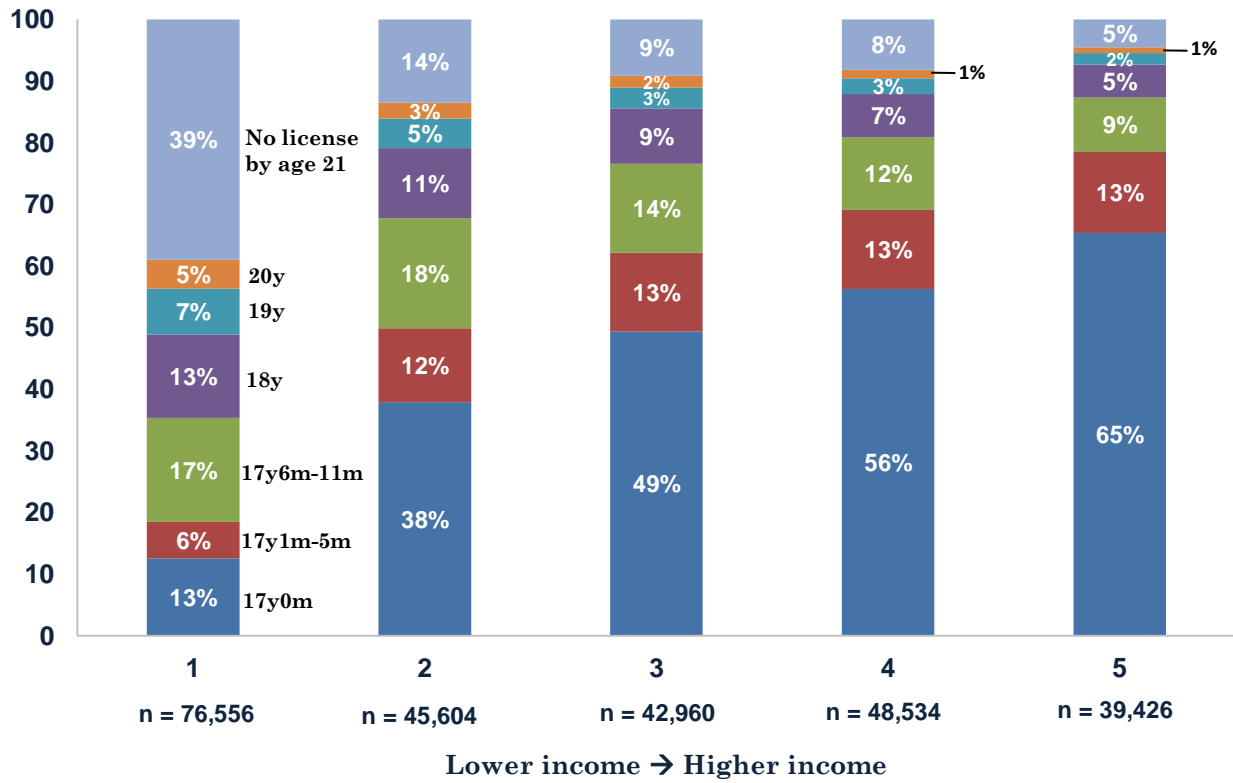
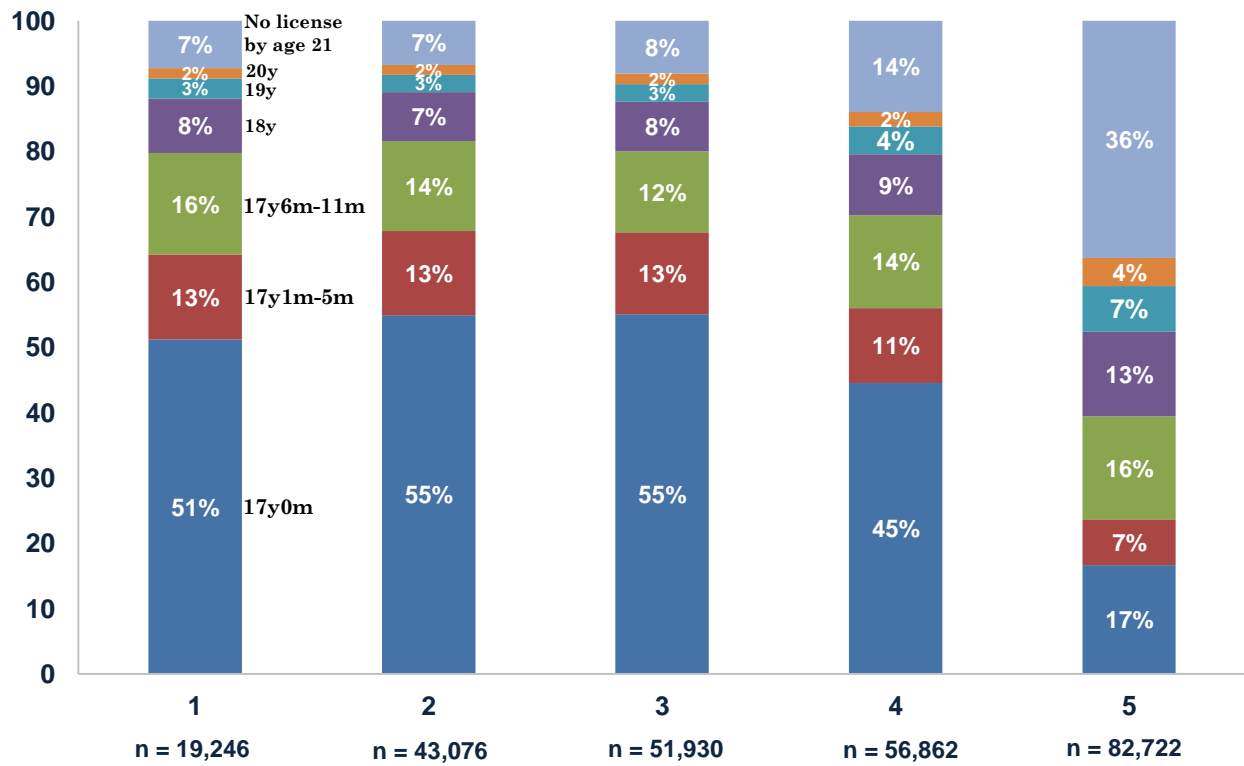


Figure 3. Licensing rates among NJ residents who turned 17 years old in 2006 and 2007, by month of age and quintiles of zip code level income.



Lower population density → Higher population density

Figure 4. Licensing rates among NJ residents who turned 17 years old in 2006 and 2007, by month of age and quintiles of zip code level population density.

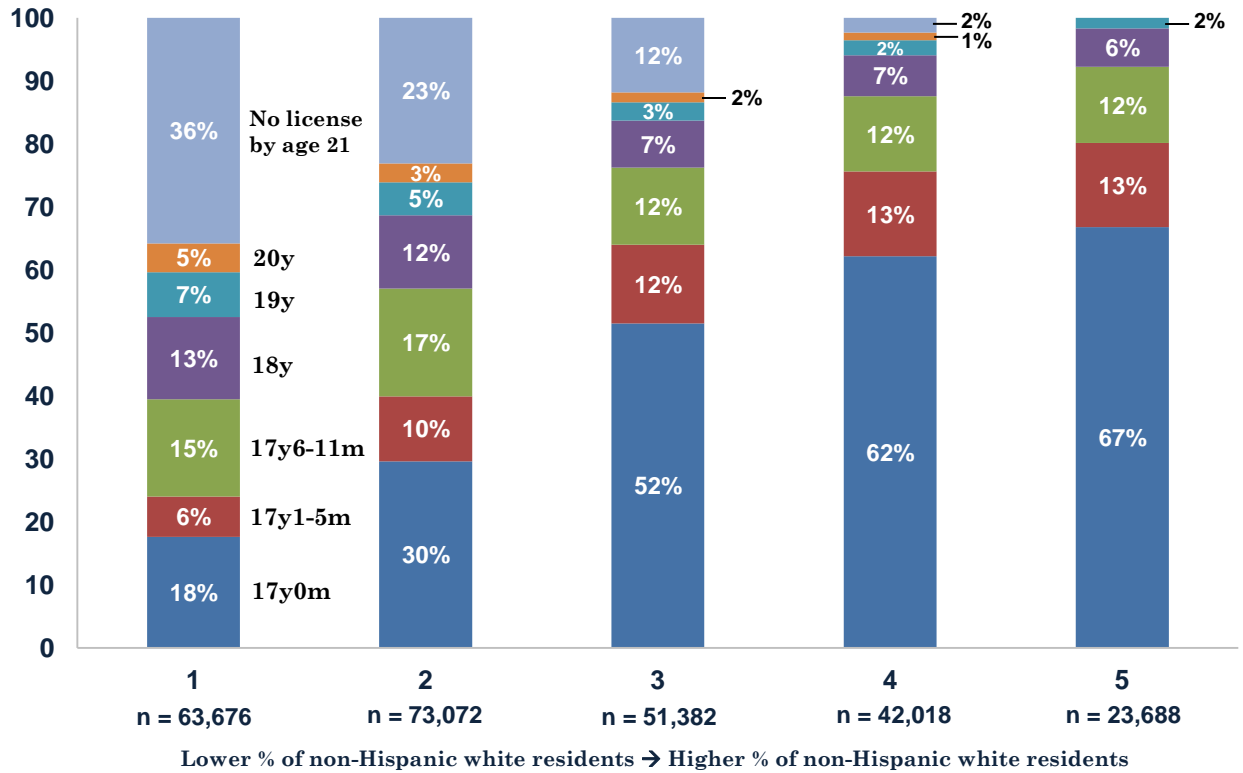


Figure 5. Licensing rates among NJ residents who turned 17 years old in 2006 and 2007, by month of age and quintiles of zip code level racial distribution (proportion of residents who are non-Hispanic white)

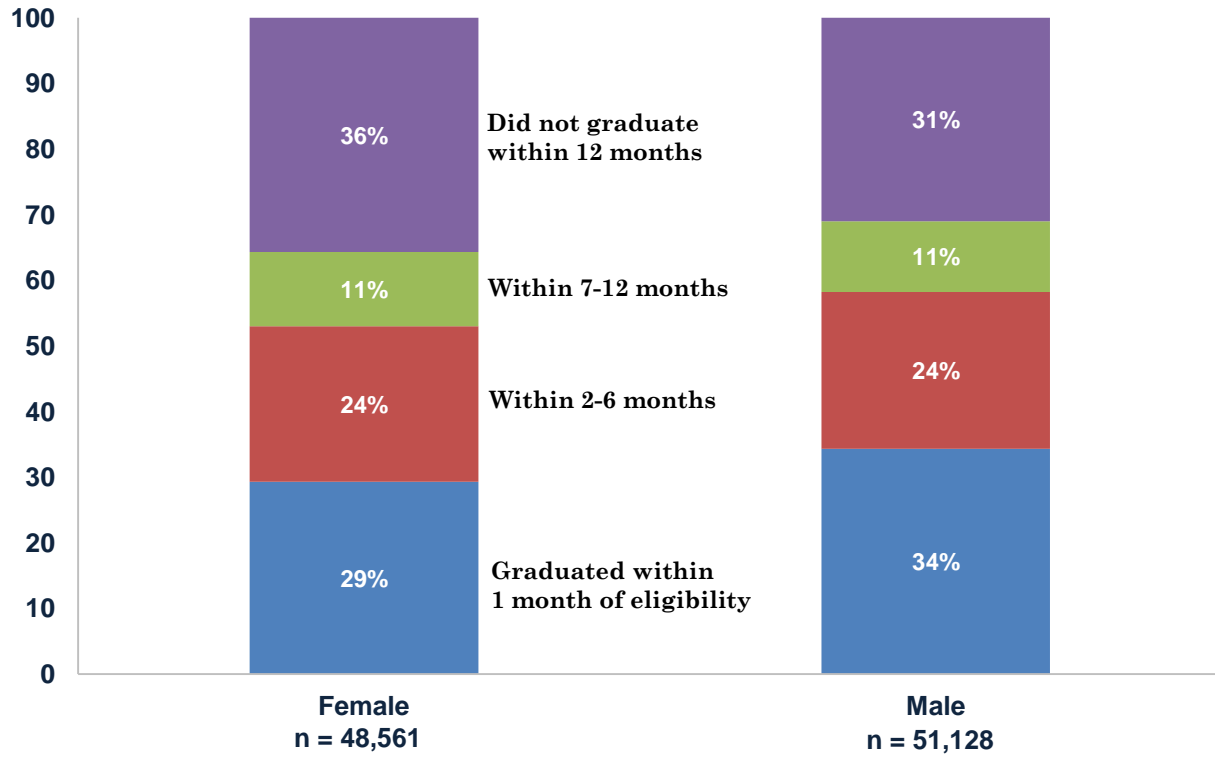


Figure 6. Rates of graduation to full licensure among NJ residents who turned 17 years old in 2006 and obtained an intermediate license before age 20, by months since eligible and gender

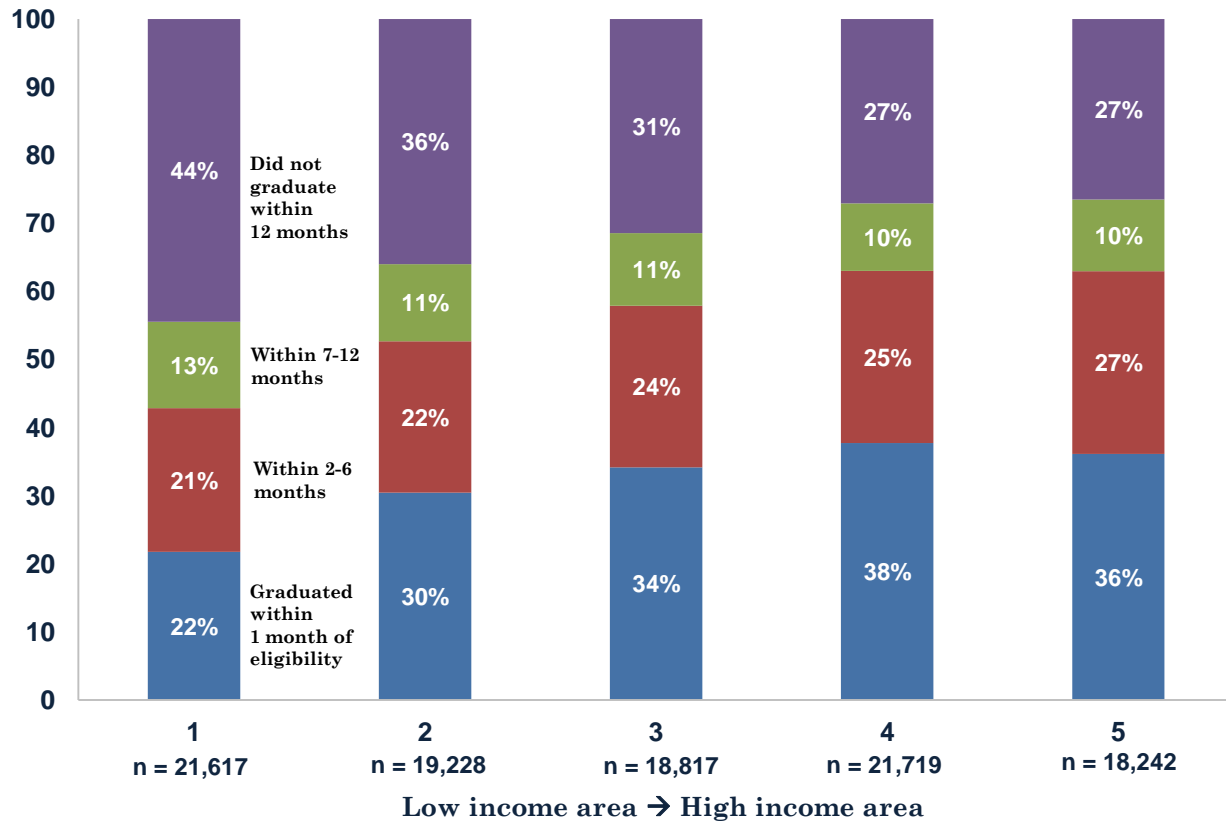


Figure 7. Rates of graduation to full licensure among NJ residents who turned 17 years old in 2006 and obtained an intermediate license before age 20, by months since eligible and quintiles of zip code level income