The Cumulative Probability of Arrest by Age 28 Years in the United States by Disability Status, Race/Ethnicity, and Gender

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Objectives. To estimate the cumulative probability (c) of arrest by age 28 years in the United States by disability status, race/ethnicity, and gender.

Methods. I estimated cumulative probabilities through birth cohort life tables with data from the National Longitudinal Survey of Youth, 1997.

Results. Estimates demonstrated that those with disabilities have a higher cumulative probability of arrest (c = 42.65) than those without (c = 29.68). The risk was disproportionately spread across races/ethnicities, with Blacks with disabilities experiencing the highest cumulative probability of arrest (c = 55.17) and Whites without disabilities experiencing the lowest (c = 27.55). Racial/ethnic differences existed by gender as well. There was a similar distribution of disability types across race/ethnicity, suggesting that the racial/ethnic differences in arrest may stem from racial/ethnic inequalities as opposed to differential distribution of disability types.

Conclusions. The experience of arrest for those with disabilities was higher than expected. Police officers should understand how disabilities may affect compliance and other behaviors, and likewise how implicit bias and structural racism may affect reactions and actions of officers and the systems they work within in ways that create inequities. (*Am J Public Health.* 2017;107: 1977–1981. doi:10.2105/AJPH.2017.304095)

In September of 2016, Alfred Olango, a 30-year-old Black man, was killed by police after his sister called 9-1-1 seeking medical assistance.[1] Olango was suffering from a mental breakdown after the loss of a friend. He was behaving erratically and walking through traffic—putting himself at risk. His sister called 9-1-1 seeking medical assistance, and told the dispatcher that her brother was mentally ill and unarmed. She called 9-1-1 repeatedly over the 50 minutes it took police to arrive on the scene, telling them that he needed to be taken to a mental health facility. Olango was erratically pacing in the parking lot of a taco shop with his hands in his pockets when the police arrived. Police officers and his sister repeatedly asked him to raise his hands. He eventually pulled an electronic cigarette from his pocket in the direction of the police, at which time one of the police offers discharged his firearm while another discharged his Taser, ending in the fatal shooting of Olango.

Olango's experience is not unique. In July of 2015, 35-year-old Paul Castaway was shot and killed by police after his mother called 9-1-1.[2] Castaway, who had a history of schizophrenia and alcoholism, was holding a knife to his own throat when he was fatally shot by police. In August of 2016, in North Carolina, Daniel Harris, a 29-year-old unarmed deaf man, was shot and killed after police attempted to pull him over for a speeding ticket.[3] In fact, a report by the Ruderman Family Foundation found that between one third and one half of all individuals killed by police have a disability.[4] Often, media reports neglect to mention disability, or in some cases the medical condition is used in part to blame victims for their deaths, leading to a lack of awareness around this crisis.[4]

In general, health and the criminal justice system are deeply intertwined.[5] Those with disabilities have multiple points of contact with the criminal justice system—including arrest, alternatives to arrest, detention, diversion, and community supervision. People in prison are 3 times more likely than the general population to report having a disability, and people in jails are more than 4 times as likely.[6] Whereas the differential treatment of those with disabilities in jail and prison is well-documented,[6–8] far less is known about the prevalence of disability in police interactions. Researchers have advocated the importance of disability-related training for employees in the criminal justice system, particularly in relation to awareness about learning disabilities, intellectual disabilities, and cognitive disabilities.[9–11] Research has shown that police lack understanding about disability and how it affects behavior or compliance ability, and that disability awareness training has the potential to have an impact on police behavior.[9] However, there are no prevalence estimates of the cumulative probability (c) of arrest for those with disabilities, and disability-related training is often scant.

A deeper understanding of the prevalence of arrests for those with disabilities, as well as how this varies for sociodemographic groups, is needed to assess the scope of the problem. Although arrest rates exist by gender (6916.1 per 100 000 for men and 2270.2 per 100 000 for women) and race (9622.8 per 100 000

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Blacks and 3934.5 per 100 000 Whites), this information is lacking for disability.[12] In this study, I sought to estimate (1) the cumulative probability of arrest by disability status, (2) the age-specific probability of arrest by disability status and race/ethnicity, (3) the cumulative probability of arrest by disability status and race/ethnicity, and (4) the cumulative probability of arrest by disability status, race/ethnicity, and gender.

METHODS

To explore these questions, I used demographic techniques to estimate the cumulative arrest probability for different groups by using birth cohort life tables. I used the National Longitudinal Survey of Youth (NLSY) 1997 to measure disability status, first-time age-specific arrest instances, and race/ethnicity. The NLSY 1997 is a nationally representative longitudinal survey (after weighting) administered by the US Bureau of Labor Statistics. In this study, I analyzed data from rounds 1 through 16 (1997–2014). The study sample comprised 8984 individuals who had complete data on race/ethnicity, gender, and disability.

Measurement

To measure disability status, I used parental reporting data from 1997 and self-reported data from 2002 to create dummy variables for each disability type. I considered any participant who reported having a sensory, physical, emotional, or cognitive disability to be a person with a disability. For sensory disabilities, if the respondent or the respondent's parent reported that the respondent had blindness in 1 eye, blindness in both eyes, difficulty hearing, or full deafness, I considered the respondent to have a sensory disability. For physical disabilities, if the respondent or the respondent's parent reported that the respondent had a deformed or missing body part, I considered the respondent to have a physical disability. For emotional and cognitive disabilities, if the respondent or the respondent's parent reported that the respondent had a learning or emotional problem that limited the respondent's ability to attend school or work, or the type of or time that can be spent on work- or school-related activities, I considered the respondent eligible for having a disability. If the respondent or the respondent's parent also reported in the follow-up question about what type of learning or emotional problem the respondent had that the respondent had an emotional or mental or other emotional problem, I considered the respondent to have an emotional disability. If the respondent or the respondent's parent reported in the follow-up that the respondent had a learning disability or mental retardation, I considered the respondent to have a cognitive disability. For race/ethnicity (White, Black, and Hispanic), gender (male, female), and age of first arrest, I used self-reported data. Black includes participants from African diaspora or people of African descent, and Hispanics excludes those who self-identify as White.

Data Analysis

I created cumulative probability of arrest estimates by using birth cohort life tables. I created a life table for the analytic sample. Then I used subsamples to create life tables based on demographic characteristics (race/ethnicity, gender, disability status). I calculated 95% confidence intervals (CIs) for each estimate. Descriptive differences must be large for significance to be found; Table 1 shows 95% CIs and sample sizes for subgroups.

RESULTS

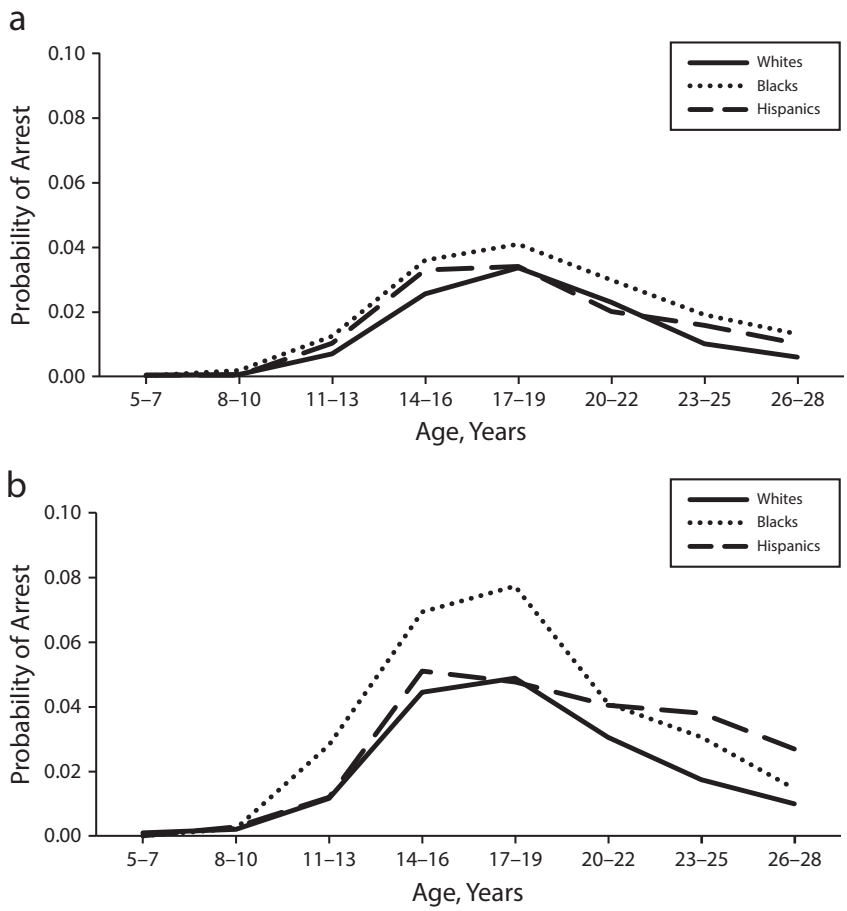
The analysis began with a description of demographic characteristics, as seen in Table A (available as a supplement to the online version of this article at http://www.ajph.org). The sample was 49% female, 71% White, 15% Black, and 13% Hispanic. The portion of the sample that had disabilities was 43% female, 77% White, 12% Black, and 9% Hispanic. Compared with the sample demographics, the racial/ethnic distribution for those with disabilities was different, with Whites and Hispanics being overrepresented and Blacks being underrepresented. Seven percent of the sample had been incarcerated, compared with 11% of those with disabilities. Nineteen percent of the sample had a disability, and, of those with a disability, 42% had an emotional disability, 13% had a physical disability, 45% had a cognitive disability, 25% had a sensory disability, and 20% had more than 1 disability.

The age-specific probabilities of arrest for Whites, Blacks, and Hispanics varied by disability status, as seen in Figure 1. For those

TABLE 1—The Cumulative Probability of Arrest by Age 28 Years by Disability Status for the Full Sample, by Race/Ethnicity, and by Gender and Race/Ethnicity: National Longitudinal Survey of Youth 1997, United States, 1997–2014

	People Without Disabilities		People With Disabilities	
Population	Cumulative Probability of Arrest (95% CI)	No.	Cumulative Probability of Arrest (95% CI)	No.
Sample	29.68 (29.24, 30.12)	7369	42.65 (40.86, 44.45)	1615
Race/ethnicity				
White	27.55 (27.00, 28.10)	3679	39.70 (37.69, 41.71)	987
Black	37.30 (36.04, 38.57)	1977	55.17 (48.83, 61.51)	358
Hispanic	31.37 (30.35, 32.40)	1650	46.12 (40.84, 51.39)	251
Race/ethnicity and gender				
Male				
White	36.45 (35.19, 37.71)	1843	47.11 (43.46, 50.76)	570
Black	53.22 (49.65, 56.79)	971	65.73 (53.05, 78.40)	198
Hispanic	43.75 (41.13, 46.37)	833	57.69 (46.69, 68.70)	144
Female				
White	18.74 (18.33, 19.15)	1835	29.84 (27.97, 31.71)	417
Black	22.37 (21.63, 23.11)	1006	41.29 (35.93, 46.66)	160
Hispanic	17.71 (17.15, 18.28)	817	28.32 (24.95, 31.70)	107

Notes. CI = confidence interval. The sample size was n = 8984.



Note. Age-specific probabilities averaged in groups of 3 years.

FIGURE 1—Age-Specific Probabilities of Arrest for (a) People Without Disabilities and (b) People With Disabilities: National Longitudinal Survey of Youth 1997, United States, 1997–2014

without disabilities, as participants aged, their probability of arrest increased until it peaked at age 17 to 19 years ($p_{Whites} = 3.36$; $p_{Blacks} = 4.09$; $p_{Hispanics} = 3.40$), and then lowered steadily until age 26 to 28 years. Blacks had slightly elevated probabilities compared with Whites and Hispanics. For those with disabilities, the age-specific probabilities of arrest were considerably higher, and the gap between the races/ethnicities was larger. For Blacks and Whites, the highest probability of arrest was still for those aged 17 to 19 years ($p_{Black} = 7.73$; $p_{White} = 4.88$). For Hispanics with disabilities, the highest probability of arrest was among those aged 14 to 16 years ($p_{Hispanic} = 5.10$). Generally, the peak of arrest was in mid- to late adolescence.

The cumulative arrest probability for the complete sample was 32.19. This equates to approximately 32% of the sample having been arrested by age 28 years. The cumulative probability of arrest varied by disability status as seen in Table 1; for those with disabilities the cumulative arrest probability was higher than the complete sample (c = 42.65), and for those without disabilities the probability was lower (c = 29.68; differences significant at the 95% level; Table 1).

The cumulative arrest probability differed by race/ethnicity. Blacks had the highest cumulative probability of arrest (c = 40.08), followed by Hispanics (c = 33.45), and Whites (c = 30.09; differences significant at the 95% level [Table 1]). For all racial/ethnic groups there was a statistically significant difference in the cumulative probability of arrest between those without and with disabilities. For Blacks, this phenomenon was particularly pronounced, with a gap of 17.87 in the cumulative probability of arrest between those with (c = 55.17) and without (c = 37.30) disabilities. For Hispanics, the gap between those with (c = 46.12) and without (c = 31.37) disabilities was 14.75. For Whites, the gap between those with (c = 39.70) and without (c = 27.55) disability was 12.15.

The cumulative probability of arrest also varied by race/ethnicity and gender. Overall, males had higher cumulative probabilities of arrest than females (e.g., there is a 17.27 difference in the cumulative probability of arrest for Whites with disabilities between males and females). For all racial/ethnic groups, across both genders, the cumulative probability of arrest was higher for those with disabilities than for those without. For Whites, the disability gap in the cumulative probability of arrest stayed the same across genders, with those with disabilities having approximately 11.0 higher cumulative probability of arrest for both White males and White females. For Blacks the disability gap was larger among females (18.92) than males (12.51); however, the total cumulative probability of arrest was higher for Black males (without disability: c = 53.22; with disability: c = 65.73) than for Black females (without disability: c = 22.37; with disability: 41.29). For Hispanics, the disability gap was larger among males (13.94) than females (10.61). The disability difference is significant at the 95% level for each gender-based racial/ethnic group, except for Blacks (Table 1).

Last, the distribution of disability types was similar across racial/ethnic groups, as seen in Table A. For all racial/ethnic groups, cognitive and emotional disabilities were the most common, with 40% of Whites, 48% of Blacks, and 49% of Hispanics having an emotional disability and 44% of Whites, 50% of Blacks, and 40% of Hispanics having a cognitive disability. For all groups, the least common disability was physical (14% for Whites, 7% for Blacks, and 9% for Hispanics). The prevalence of multiple disabilities was also similar (19% for Whites, 21% for Blacks, and 19% for Hispanics).

DISCUSSION

These findings show that the cumulative probability of arrest was experienced

differently by disability status and demographic characteristics (race/ethnicity and gender). The cumulative probability of arrest was significantly higher for those with disabilities (c = 42.65) than for those without disabilities (c = 29.68) at the 95% level (Table 1). This pattern persists when one looks at disability status and race/ethnicity, with Blacks experiencing the highest cumulative probability of arrest (c = 40.08), including those without disabilities (c = 37.30) and with disabilities (c = 55.17). Whites experienced the lowest cumulative probability of arrest overall (c = 30.09), and for those without disabilities (c = 27.55) and with disabilities (c = 39.70). Whites with disabilities compared with Whites without have a 30.60% increased cumulative probability of arrest, compared with 32.39% for Blacks and 32.61% for Hispanics.

This study builds on the existing literature through 3 primary contributions. First, the prevalence of arrest is high for those with disabilities. Although there were not previous estimates, these are higher than many previously thought. This indicates a need for additional inquiry to uncover the mechanisms behind this gap, and policy reform regarding police training. A needs assessment should be conducted to identify training needs. This is particularly important when one considers how prevalent arrest is for those with disabilities (as found in this study), as well as the disproportionate number of arrest-related deaths for this population.[5]

Second, this study showed that the disability status gap in the cumulative prevalence of arrest is experienced differently by racial/ethnic group and gender. The risk of arrest was distributed disproportionately across disability groups and racial/ethnic groups, compounding risk for those who are disabled and racial/ethnic minorities. Blacks with disabilities are at a particularly high risk of arrest, with 55% being arrested by age 28 years. This disability gap in the cumulative probability of arrest persists when one looks at racial/ethnic groups by gender—with a gap of approximately 11.0 between those with disabilities and those without for White males and White females, a disability gap that is larger for males (13.94) than females (10.61) for Hispanics, and a disability gap that is larger for females (18.92) than males (12.51) for Blacks. The risk of arrest is compounded for Black males with disabilities, and future research should explore the specific implications of this increased risk.

Last, the distribution of disability types for those with disabilities across racial/ethnic groups was similar (Figure A, available as a supplement to the online version of this article at http://www.ajph.org), supporting that racial/ethnic differences in the cumulative probability of arrest by age 28 years are not the result of differences in the distribution of disability type but, perhaps, a result of racial/ethnic discrimination. Differences exist by race/ethnicity in how law enforcement officers and the systems they are attached to interact with individuals. The similar distribution of disability types across racial/ethnic groups suggests that the differences in the cumulative probability of arrest across racial/ethnic groups stems from racial/ethnic inequalities, as opposed to differences in the distribution of disability types for those with disabilities across racial/ethnic groups. Because of sample size constraints, I was unable to calculate cumulative arrest probabilities by disability type (emotional, physical, cognitive, sensory, or multiple) and race/ethnicity. Future research should explore how cumulative arrest probabilities vary by disability type and race/ethnicity, and seek to confirm and explore the mechanisms behind racial/ethnic differences in the probability of arrest for those with disabilities.

Despite the important contributions to the literature, this study has several limitations. First, there are threats to internal validity in the measurement of disability and arrest history. The use of self-reported data contributed to the threat to internal validity, particularly where desirability bias may have caused underreporting (such as reporting emotional difficulties or arrests). To minimize this threat, I used parental reporting data in addition to self-reported data for the measurement of disability. If disability and arrest were underreported, then these estimates may be conservative. Second, the data did not include a question specifically about disability, and definitions of disability vary widely. Future longitudinal studies should ask specifically about self-perceived disability status with a common definition. Last, the sample size was small, which may have added some uncertainty to estimates for which smaller subsections of the sample were used (e.g., Hispanic females with disabilities). Although the estimates calculated here suggest considerable differences in the disability gap for racial/ethnic groups by gender, these results should be confirmed by additional research with a larger sample size in which more stable estimates could be produced. In addition, the small sample size constrained the possibility of estimating the cumulative arrest probabilities by race/ethnicity and disability type (e.g., cognitive vs physical), which would have strengthened the findings.

Public Health Implications

Public health researchers and policymakers must explore how police and correctional officers interact with those with disabilities. When we consider the complicated intersection of disability and criminal justice, we need to question how individuals who work within the criminal justice system view and approach the public, particularly given the likelihood of interacting with someone with a disability. Future research should build upon these findings, exploring the mechanisms and consequences behind the high prevalence of arrest for those with disabilities. In addition, police training with a greater emphasis on de-escalation, minimizing use of force, the history of race/ethnicity and law enforcement, and the role of implicit bias in police interactions may help better protect vulnerable members of the community.

Another core way to decrease the severity and frequency of criminal justice contact for those with disabilities is to ensure high-quality care. For many with disabilities, quality health care is imperative for positive functioning within the community through increasing access to medication and support services.[13] Preventing contact with the criminal justice system, in addition to training police officers on how to better handle the interactions that do occur, will help to better protect those with disabilities.

Conclusions

The experience of being arrested is a fairly common one for those with disabilities—particularly those with disabilities from racial/ethnic minority groups. Policymakers need to wake to the risk of untrained policemen for those with disabilities. The current lack of training and awareness of disability and how

having a disability may affect compliance and behavior leaves those with disabilities at high risk, particularly given the high prevalence of arrest for this group. Furthermore, policymakers and researchers need to think more critically about how policing and disability contributes to broader inequality, with particular attention paid to the intersection of race/ethnicity, gender, and disability status. Increasing awareness of disability alone will not likely protect the well-being of those with disabilities. Interventions need to be developed and policies need to be changed to address the difference in increased vulnerability that racial minorities with disabilities face because of racism and structural forces. AJPH

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HUMAN PARTICIPANT PROTECTION

Institutional review board approval was not needed because only existing publicly available data were used.

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