



**Office for
the Aging**

IMPACT OF INCREASING WAGES FOR HOME HEALTH CARE WORKERS IN NEW YORK STATE

Final CIPA Capstone Report

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Executive Summary

There is a severe shortage in the home care workforce which affects access to services, autonomy and quality of life for older adults and persons with disabilities in Tompkins County as well as across the state. According to the Bureau of Labor Statistics, an additional 1.1 million workers are needed to meet an expected 26 percent increase in demand by 2026. However, the industry is adding workers at a much slower rate, seeing only a 600,000 job increase in 2016 (BLS, 2018). Currently the Tompkins County Office for the Aging is partnering with the New York State Office for the Aging and many others on a working group to address this systemic issue. The purpose of this report is to make the business case that an investment in home health care workers through a living wage with benefits is a sound economic development and job creation strategy that will improve health outcomes and save the state of New York money on Medicaid and other social safety net programs.

Trends collected from multiple studies over the past several decades indicate that the home care industry has consistently been a growth industry. However, as home care workers straddle the informal arena of the home and formal employment and, as such, traditional management models for care workers do not apply well to them. High levels of job stress, potential for physical injury, and high turnover rates all contribute to an environment of instability within the industry. Potential solutions to these issues include lowering the work burden for home care workers, enhancing medical and nursing training in geriatrics and gerontology, and monetary incentives for home care workers. A significant amount of research has been done on the impact of raising the minimum wage. Most research indicates that raising wages for home care workers will boost the economy, increase capital accumulation, lead to better population health and avoid disemployment effects due to the wage increase being funded by government expenditure.

Using data from 2016 U.S. Census Bureau American Community Survey, 2007 National Home Health Aide Survey and 1979 National Longitudinal Survey of Youth, this report conducted cost and benefit analysis, as well as longitudinal analysis to evaluate the impact of increasing wages for home health care workers on the economy of New York State. Demographic analysis of trends within the home healthcare industry revealed a working

cohort under severe economic and psychological pressures. An analysis of the 2007 Home Health Aide Survey indicated that burnout was experienced by an extremely high number of individuals within the cohort; 12.6 percent of the synthetic cohort experienced burnout within the first six months, with that number increasing by twenty to 36.6 percent of the population by the end of the first year. Moreover, results from a longitudinal analysis of welfare utilization by home health aides within the 1979 National Longitudinal Survey of Youth cohort indicate that 15.4 percent of home health workers within the cohort were enrolled in Aid to Families with Dependent Children (AFDC) by the end of the recorded period.

According to the current Standard Occupational Classification from the Bureau of Labor Statistics (BLS, 2010), the home health care workforce consists of two types of jobs: Personal Care Aides and Nursing/Psychiatric/Home Health Aides. In New York State, a typical home health aide is a middle-aged, black or African American woman who was born in the USA, with a regular high school diploma. Their working status is on average 35.5 hours per week and they earn \$21,276 annually. Meanwhile, a typical personal care aide is a middle-aged, white woman who was born in the USA, with a regular high school diploma. These individuals work an average of 34.9 hours per week and earn \$19,053 annually.

Our analysis found that costs of increasing wages for all personal care aides and home health aides are projected to be high. 156,830 personal care aides are currently employed in New York State. 56.22 percent of these individuals earn less than \$25,000 annually, 63.04 percent earn less than \$30,000 annually, and 70.32 percent earn less than \$35,000 annually. The estimate costs to the State of New York of increasing their annual wages to \$25,000, \$30,000, and \$35,000 are \$1.081 billion, \$1.561 billion, and \$2.102 billion respectively. Similar rates can be observed for home health aides. Of the 173,830 home health aides employed in New York State, 49.35 percent earn less than \$25,000 annually, 58.33 percent earn less than \$30,000 annually, and 66.17 percent earn less than \$35,000 annually. The estimated costs to the State of New York of increasing their annual wages to \$25,000, \$30,000, and \$35,000 are \$613 million, \$909 million, and \$1.25 billion respectively.

One notable area of savings is through the decreased utilization of social safety net programs such as Medicaid and the Supplemental Nutrition Assistance Program (SNAP). As

these programs are means-tested, any home health care workers who are paid a living wage will likely transition away from the program due to the increase in wages. Annual savings in money spent on Medicaid and SNAP programs are projected to be \$582 million, \$622 million and \$665 million if the government increased the annual income of home healthcare workers to \$25,000, \$30,000, and \$35,000 respectively.

Under the current cost and benefit analysis, the benefits cannot offset costs. However, investing in a living wage and benefits for workers aside from salary may result in benefits gained from increased consumption of transportation, housing, food and other goods and services. Also, the elderly can benefit from a reduction of the home care workers shortage, and thus reduce preventable hospital visits and costs. Based on these conclusions, we recommend prioritizing analyses about preventable healthcare expenditures in the future, as well as shifting from assessment via a cost-benefit analysis (CBA) to utilizing the social welfare function (SWF). The SWF framework conceptualizes the status quo and each policy alternative as a pattern of well-being across the population (home care workers, elderly and other stakeholders) of concern. We additionally recommend developing a new survey of New York's home healthcare workforce based on the 2007 National Home Healthcare Aide Survey to provide policymakers with a more up-to-date picture of what the state's home healthcare workforce looks like.

Background

New York's demographic structure is reflective of many of the same major demographic forces that are shaping larger national population trends, including an aging population and a shift in the composition of diseases from infectious to chronic conditions. The State's median age increased from 30.3 years in 1970 to 32 years in 1980 and now exceeds 38 years (Scarmalia, 2015). According to the NYS Office of the Aging, 25 percent of the population in 51 of the state's 62 counties will be age 60 or older by 2025 (NYSOFA, 2015).

This aging population is projected to bring with it an increase in individuals people aged 65 and over with functional impairments. The New York State Office for the Aging currently projects the population will grow by a rate of 17.1 percent to number 854,956, with 692,521

living independently in the community, and 162,435 living in nursing homes or other group care facilities (NYSOFA, 2011). These trends are projected to increase pressures on existing long-term services and supports (LTSS) that help older adults and individuals with disabilities accomplish everyday tasks such as bathing, dressing, fixing meals, and managing a home. These LTSSs require a strong and active workforce that can meet this growing demand.

However, despite increasing need for long-term services and supports, there is a severe shortage in the home care workforce which affects access to services, autonomy and quality of life for older adults and persons with disabilities across the State of New York. According to the Bureau of Labor Statistics, an additional 1.1 million workers are needed nationally to match the projected 26 percent increase in demand by 2026 (BLS, 2018). However, the industry has added workers at a much slower rate, seeing only a 600,000 job increase in 2016.

Currently, the Tompkins County Office for the Aging is partnering with the New York State Office for the Aging and other key stakeholders to address this systemic issue. Our team's goal on this project is to make the business case that an investment in home health care workers via a living wage with benefits is a sound economic development and job creation strategy that will improve health outcomes, save the state of New York money on Medicaid and other low wage benefits, and have a positive impact on the local and state economy and local businesses.

Literature Review

Broader Social Contexts

The United States Census Bureau predicted that the life expectancy of the average U.S. citizen will increase from 77.9 years to 82.6 by 2050 (U.S. Census Bureau, 2000). Coupled with the growing medical complexity of long-term care and chronic diseases, this increase in life expectancy has produced a growing demand for services and social support systems that require direct care workers to function (Cooper et al., 2016). Persons demanding these services often require assistance with activities of daily living (ADLs) such as bathing, dressing, eating, and walking (Sahyoun, Pratt, Lentzner, Dey, & Robinson, 2001). Compounding these ADLs are frequent alterations in health experienced by older adults such as pressure ulcers (White-

Chu, Flock, Struck, & Aronson, 2011), depression (Thakur & Blazer, 2008), infection (High et al., 2009), falls (Wallis & Campbell, 2011) and failure to thrive (Robertson & Montagnini, 2004).

Multiple trends over the past several decades have reduced the likelihood that older adults will receive care and support from family members. Prince et al. identify these trends as including factors such as declining birth rates, enhanced workforce mobility and urbanization, a more highly educated female population, and the tendency of adult children to live away from their families (Prince et al., 2013). This has resulted in a growing demand for both institutional and paid provision of care, with the proportion of older adults receiving care within their homes in OECD countries estimated to be as high as 65 percent (KPMG International, 2013).

Issues and Trends in the Home Healthcare Industry

Home healthcare workers are a part of the larger healthcare aide workforce. Healthcare aides (HCAs) in the United States are referred to by a variety of different terms and are largely unregulated by federal and state authorities (Hewko et al., 2015). These factors contribute to the relative invisibility of this workforce in the eyes of researchers, patients and the public. The United States Bureau of Labor Statistics defines healthcare aides as workers who assist disabled, elderly and/or ill (acute or chronic) individuals requiring either short-term aide or long-term support with daily living activities (Bureau of Labor Statistics, 2018).

There is a consistent body of literature showing that high staff-to-resident/client ratios are correlated with higher quality of care (Castle, 2008; Harrington et al., 2012; Katz, 2011). Despite this, staffing levels among both nursing homes and other long-term care organizations are often reported as inadequate to meet the growing demands of this vulnerable population (Grabowski, Aschbrenner, Rome, & Bartels, 2010; Harrington et al., 2012).

The home care workforce has doubled in size over the past 10 years as the delivery of long-term services and supports has increasingly shifted from institutional settings, such as nursing homes, to private homes and communities (PHI, 2017). Data from the U.S Census Bureau and the Bureau of Labor Statistics notes that nine in ten homecare workers are women, more than half are persons of color, and the median age among workers is 45 (U.S Census Bureau, 2016; BLS, 2016).

Home-based healthcare has transformed over the past several decades into a public

service supported by industry contractor organizations due to a series of cultural, demographic, and epidemiological changes in American society (Boris & Klein, 2006). From 2015 to 2050, the population of adults aged 65 and over will almost double, growing from 47.8 million to 88 million. The number of adults aged 85 and over is expected to more than triple over the same period, from 6.3 million to 19 million (U.S Census, 2016; PSI, 2017). Additionally, managing chronic conditions that occur as individuals age is increasingly becoming the primary concern of the healthcare systems (Epping-Jordan et al., 2004). Further, shifts in preferences among elders to prefer community-based living over institutionalization have led to a slow shift in healthcare systems to models that employ more paid home healthcare workers over traditional nursing assistants (Dawson & Surpin, 2000).

These demographic and epidemiological shifts are the main driver behind the expected increase in demand for home health care workers in the coming decades. A comparatively slow amount of growth in the home health care industry has led both scholars and industry professionals to discuss a potential ‘crisis’ in long-term care for elderly people (Stone and Weiner 2001; PSI, 2017). Specific issues cited by these experts include quality of training for home healthcare workers, shortages within the industry, and high turnover rates, all of which fit a decades-long pattern of labor force instability in the industry (Burbridge, 1993).

Home care workers straddle the informal arena of the home and formal employment (Folbre, 2001). Research into their job stressors and support has been sparse compared to research in institutional settings. Compounding this issue, theoretical frameworks developed for managing staff within the nursing home industry have limited applicability to care provided in the home (Kemper 2007). While models do exist for managing unpaid family caregivers (Aneshensel et al. 1995), they are also likewise limited in application to paid home care workers due to their status as paid employees. Efforts to improve the work life of home-care workers should acknowledge the strengths of consumer-directed approaches and target all workers across models (Benjamin & Matthias, 2004).

Home healthcare workers are often regarded as necessary by clients who have developed disabilities that necessitate assistance with activities of daily living (Johansson, 1995). Home health care workers have also been shown to have an important role in improving health literacy among elderly managed care enrollees (Baker et al., 2002).

Job stress and job satisfaction among workers in the industry has been noted to be an issue, with organizational change, fear of job loss, heavy workloads, and lack of organizational

and peer support all contributing to increased levels of stress (Denton et al., 2002). Job satisfaction among home healthcare workers has been noted to be negatively impacted by a host of factors, including abuse from consumers, unpaid overtime hours, and overwhelming caseloads (Delp et al, 2002).

Related to job stress and satisfaction is the issue of burnout. Maslach and Leiter define burnout as “an individual response associated with work related stress over a prolonged period of time which can affect job satisfaction, productivity, performance, turnover and wellbeing of both the professional and recipient of work” (Maslach & Jackson, 1981; Maslach, Jackson, & Leiter, 1996). Burnout is composed of emotional exhaustion: an individual’s loss of emotional resources and emotional/coping energy (Maslach & Jackson, 1981; Maslach et al., 1996); depersonalization: an individual’s detachment (including emotional detachment) from the patient or resident, includes negative attitudes toward and lack of compassion for patient or resident (Maslach & Jackson, 1981; Maslach et al., 1996); and decreased personal accomplishment: an individual’s negative feelings towards their own work and perception of competence (Maslach & Jackson, 1981; Maslach et al., 1996). Issues within organizations that have been identified as contributing to burnout in allied health professions and health care aides include: characteristics of high workload, high acuity of residents or patients, little time to perform tasks, and lack of congruence between employee and employer values (Josefsson, Sonde, Winblad, & Wahlin, 2007; Leiter & Maslach, 2009; Stevens, 2008).

Turnover rates for home healthcare workers have been reported differently across various studies. Annual turnover rates in studies ranged from 59.4 % (Donoghue and Castle, 2009), to 170.5 % (Anderson et al., 2004). Six-month turnover rates ranged from 13.1 % (Pillemer et al., 2008), to 64.4% (Castle, 2008). Additional studies have reported three-month turnover rates near 19% (Donoghue, 2010; Temple, 2009). Two studies found that increasing age was significantly associated with lower individual risk of turnover (Smith and Baughman, 2007; McCaughey et al., 2012). Race/ethnicity has been noted to have a significant but equivocal relationship with turnover for healthcare aides (Castle et al., 2007; Smith and Baughman, 2007; McCaughey et al., 2012). The relationship between marital status and turnover has also been examined, but results have proven inconclusive (Castle et al., 2007; Smith and Baughman, 2007).

United States-based studies of ‘intent to leave’ among home healthcare workers have found a positive association between intent to leave and younger age (Sloane et al., 2010;

Baughman et al, 2012). U.S. based studies also found that education levels greater than high school were associated with an increased likelihood of intending to leave a job among healthcare aides (Choi and Johantgen, 2012; Brannon et al., 2007)

In academic surveys asking home healthcare workers why they chose to work in the industry, commitment to their clients was the most important reason, followed by schedule flexibility and access to benefits such as health insurance (Howes, 2008). Other qualitative studies have noted that home healthcare workers draw a sense of dignity and purpose from interpersonal contact with their elderly contact (Stacey, 2005).

Delp et al. note that adequate benefits and sufficient authorized hours of care can minimize the stress and instability that home healthcare workers face in their line of work (Delp et al, 2002). Ejaz et al. add to this argument by noting that financial strain and health status have been cited also as personal stressors in employee retention models (Ejaz et al. 2008). Increases in hourly wages to above \$9 an hour has also been noted to matter to employees in this industry (Howes, 2008).

Multiple studies have found that higher wages for home healthcare workers were negatively associated with turnover (Baughman et al., 2012; Temple et al., 2009; Kash et al., 2006; McCaughey et al., 2012). Studies examining the relationship between benefit provision and HCA turnover in the U.S. have proven inconclusive, two studies showing a negative association between turnover and benefits (Baughman et al., 2012; Temple et al., 2009), while three studies showed no significant effects (Smith and Baughman, 2007; Dill and Cagle, 2010; Konetzka et al. 2005).

Worker Benefits

The proportion of healthcare aides in the United States without health insurance ranged from 12.7 % among immigrants employed in nursing homes to 33 % in home health (Khatutsky, 2010; Dills et al., 2010). Only 25.5 % (in home health) to 62.3 % (in hospital) opted to utilize employer-provided health insurance (Yamada, 2002). Additional studies of job benefits for U.S. based healthcare aides found that the proportion healthcare aides of with a pension plan ranged from 60 % to 71.2 % in micropolitan areas, while the proportion of U.S. HCAs with paid sick time varied from 65.7 % to 79 % (Probst et al., 2009; Temple et al., 2009). Union membership differed across among healthcare aides in the U.S. ranged from 10.4 % to 19 % nationally

(Brannon et al, 2002; Ribas et al., 2012).

Studies on job benefits received by Canadian home health aides found that they on average received benefits such as pensions, health insurance, and paid sick leave at lower rates than their counterparts in nursing homes (Nugent, 2007; Keefe et al., 2011). Provision of subsidized transportation as a job benefit varied greatly across this setting with 3.9 % of rural nursing home healthcare aides and 38.7 % home health care aides receiving it (Probst et al., 2009; Nugent, 2007). In general, home healthcare aides were found to have generally lower wages and be less likely to receive benefits (Keefe et al., 2011; Temple et al., 2010).

Injury and Illness among Home Healthcare Workers

The overall annual injury rate among home health aides in the United States was reported at 18.5% (McCaughey et al., 2012). This is a significantly lower annual injury rate when compared to the overall injury rate among U.S.-based nursing home healthcare aides, which was found to be 59 percent (Squillace et al., 2009; Choi and Johantgen, 2012). Several Canadian studies found that the most common injuries experienced by healthcare aides in general were musculoskeletal injuries, with Ngan et al. finding that they accounted for 84% of all work-related injuries (Ngan et al., 2010; Alamgir et al., 2007).

D'Arcy, Sasai, and Stearns found statistically significant correlations between healthcare aides having less training and having less healthcare aide experiences and their likelihood of being injured on the job (D'Arcy, Sasai, and Stearns, 2012). McCaughey et al. found that healthcare aides who reported feeling less prepared by their training were also more likely to be injured on the job (McCaughey et al., 2012). These studies also noted that the availability of equipment was related to reduced rate of injury (D'Arcy, Sasai, and Stearns, 2012; Ngan et al., 2010). Additionally, workplace aggression was reported as a risk factor for injury (Ngan et al., 2010; Keefe et al., 2011).

Proposed Solutions to Issues in the Home Healthcare Industry

With an aging population, increase in the incidence of chronic disease, and other aforementioned influential factors, the need for experienced, highly skilled home care workers is rapidly increasing around the United States. However, the labor force currently

devoted to the home care field far from meets the demand. In addition to the reduction of the availability of physicians and nurses due to population dynamics, decreased job dissatisfaction further aggravates the shortage (Cohen, 2009).

The home care worker shortage relates not only to recruiting workers into the profession but also retaining workers in practice (Anthony & Milone-Nuzzo, 2005). High rates of turnover have been observed to correlate with a lower quality of life among the elderly, persons with disabilities, and their families. On the provider side, high turnover rates create additional costs to recruitment, orientation, and training (PHI, 2003). Potential solutions to this shortage include lowering the work burden for home care workers, and enhancing medical and nursing training in geriatrics and gerontology, and monetary incentives for home care workers (Cohen, 2009; Anthony & Milone-Nuzzo, 2005).

Lowering Work Burden for Home Care Workers

Anthony and Milone-Nuzzo (2005) collected descriptive data on job satisfaction from practicing home care nurses in Connecticut. They found that paperwork burden was the main reason practicing nurses considered leaving home care. Thus, they recommended that related agencies and health departments simplify the administrative process, including decreasing the documentation time required, developing new documentation models that reduce the real or perceived paperwork burden, and increasing the use of technology to decrease paperwork. In addition to paperwork, physical work is another burden for practicing home care nurses, especially as the nurse workforce also ages. Home care agencies may want to consider exploring more job sharing to decrease the physical demands involved in home care. Flexibility with more location options and part-time employment could attract and retain more home care nurses.

Increasing Medical and Nursing Training

Anthony and Milone-Nuzzo also noticed the important role of seasoned home care nurses. They mentioned that home care agency management must pay attention to seasoned home care nurses to retain their valued expertise within the organization. Mentoring programs for new home care nurses may be a helpful practice. Home care nurses' practice is

often isolated from peer support, but mentoring programs offer less experienced home care workers professional suggestions and build the new nurses' overall confidence (Humphrey & Milone-Nuzzo, 1996). The nonprofit Paraprofessional Healthcare Institute (PHI) found that providing a high-quality employer-based educational program can improve the retention rate of home care workers. During the training process, participants are motivated to work hard because they know that if they can meet the challenges of the program, they are guaranteed a job with the same agency that trained them. More importantly, educational programs provide the support new employees need to meet the challenges of employment. In addition to providing training through a standard home care curriculum, these programs also integrate the development of critical thinking, communication, and interpersonal problem-solving skills and offer significant on-the-job support to new employees. These results show that these programs can significantly increase retention (PHI, 2003). Korczyk (2004) conducted a study in Australia, Canada, France, Denmark and the Netherlands, looking into issues related to long-term home care workers. He found that training was important to retaining home care workers because it provided opportunities for horizontal and vertical career mobility to keep workers in the profession.

Monetary Incentives for Home Care Workers

The U.S. Bureau of Labor Statistics data shows that home care worker wages stagnated over the past 10 years: inflation-adjusted median hourly wages were \$10.33 in 2006 and \$10.49 in 2016. Low annual earnings result in a high poverty rate among home care workers: 23 percent live in households below the federal poverty line, compared to 7 percent of all U.S. workers (PHI, 2017). Raising the minimum wage for home care workers has been viewed as a potential solution to this issue. Other monetary incentives includes providing just compensation for job-related expenses like gasoline and making a range of financed rewards like insurance benefits available (Kingma, 2003).

The Impacts of Raising Minimum Wages on Home Care Workers

Minimum wage was enacted as a part of the Fair Labor Standards act (FLSA) in 1938. Realizing the labor markets were imperfect, economists believed a fair minimum wage

would help the economy function better. With time economists began to focus on analyzing issues associated with raising minimum wages. The impacts of raising the minimum wage are controversial. Disemployment effects have been examined in several specific low-wage sectors, such as the fast food industry (Katz and Krueger, 1992; Card and Krueger, 1994, 2000; Neumark and Wascher, 2000) and the retail-trade sector (Kim and Taylor, 1995; Partridge and Partridge, 1999; Sabia, 2008; Addison and Blackburn, 2009). The consensus is that a fair increase in the minimum wage has no discernible effect on employment (Schmitt, 2013) and compresses wage distribution with positive spillovers on higher wages (Lee, 1999; Bauducco and Janiak, 2018). The disemployment effect is significant only when the increase of the minimum wage is very large or when specific demographic groups (like fast-food industry in NJ) are considered (Neumark and Wascher, 2000).

A recent study using the large-firm search and matching model suggests that even though there is a decrease in employment, a moderate increase in the minimum wage has large positive effects on capital accumulation and aggregate output (Bauducco and Janiak, 2018). Raising the minimum wage is believed to help boost the economy because it predominantly benefits low-wage workers who are more likely to spend additional income (Hall and Cooper, 2012). Since raising the minimum wage helps to address poverty, it can lead to improved population health. Analyzing data from 24 OECD countries, a recent study found that higher minimum wages are associated with significant reductions of overall mortality rates and the number of deaths among people with low socioeconomic status (Lenhart, 2017).

As discussed above, there is a shortage in home care workers. In our case study, raising minimum wage for home care workers will have all the benefits mentioned before and avoid disemployment effects because the increase in minimum wage is directly funded by government expenditure.

Data and Methodology

Life Table Analysis Methodology: Synthetic Cohort Life Table

Cohort data for this analysis was acquired via the National Home Health Aide Survey (NHHAS) conducted by the National Center for Health Statistics (NCHS) in 2007. The

purpose of this survey was to provide national estimates of home health aides employed by agencies that provide home health and/or hospice care. These agencies were sampled by the National Home and Hospice Care Survey (NHHCS), then up to six home health aides were sampled from eligible participating NHHCS agencies. The NCHS considered home health aides eligible to participate in NHHAS if they were both “directly employed by the sampled agency” and “provided assistance in activities of daily living (ADLs), including bathing, dressing, transferring, eating, and toileting.” (CDC, 2009).

NHHAS was administered to aides during their nonworking hours by interviewers who used a computer-assisted telephone interviewing (CATI) system to collect data. The survey instrument included sections on recruitment, training, job history, family life, management and supervision, client relations, organizational commitment and job satisfaction, workplace environment, work-related injuries, and demographics. A total of 3,377 interviews of aides working in agencies providing home health and/or hospice care were completed between September 2007 and April 2008.

Two questions in the survey were relevant to the construction of the life table. The first, question B4, asks “Since you first became a home health aide, how long have you been doing this kind of work, including the time at your current job?” and includes seven potential answers: 6 months or less, 6 months to 1 year, 1 to 2 years, 2-5 years, 6-10 years, 11-20 years, >20 years. These categories were used to construct the age intervals used in the life table analysis. The second question, H8, asks “How likely is it that you will leave this job at {AGENCY} in the next year?”, with the potential responses being “very likely [1]”, “somewhat likely [2]”, “or not at all likely [3].” Individuals who responded “very likely” or “somewhat likely” were used to construct the ‘event’ for the life table.

Responses to questions B4 and H8 were used to construct a synthetic cohort life table that analyzes retention and burnout rates based on the 2007 NHHCS cohort. Age intervals were defined as time spent employed as a home health aide according to the seven categories laid out in question B4. The event, employee burnout, was defined as answering “very likely” or “somewhat likely” to question H8.

Rates of utilization for means-tested social safety net programs were formulated using questions D18 (Do you participate in any government programs that pay for medical care such as Medicaid?), E12 (Have you ever received cash welfare (TANF/AFDC) for families and children?), E14 (Have you ever received Food Vouchers or food items from WIC?), and E16a

(Have you ever received food stamp benefits?). These programs were selected based on their status as means-tested social safety net programs, allowing them to serve as indicators of both program utilization and socioeconomic status.

Age intervals were defined similarly to the burnout analysis. The event (means tested social safety net program utilization) was defined as answering yes to the appropriate question for each program (D18 for Medicaid; E12 for TANF; E14 for WIC; E16a for SNAP).

Based on rates observed in each age band, period rates were constructed for a hypothetical cohort of 100,000 home health aides. This allows us to observe rates of survival until “burnout” is experienced based on the rates observed in the 2007 NHHCS cohort. Data in the life table is structured in such a way that all initial time points are consolidated at time “0”. In other words, irrespective of when exposure (employment) begins, the analysis temporarily aligns all beginning points to a singular, shared beginning point. What is being observed here is the length of time from hiring to ‘burnout’.

Cost-Benefit Methodology

The primary data source for cost-benefit analysis is the American Community Survey (ACS) 2016 1-year Public Use Microdata Sample (PUMS) from the U.S. Census Bureau.¹ There are two different datasets available for New York State in 2016. ACS PUMS population records contain most population characteristics, such as gender, education attainment, age, occupation, personal income, etc. ACS PUMS housing unit records contain most housing characteristics, such as living environment, marital status, children situation, family size, family income, etc. To obtain full records for individuals, we combined the population and housing characteristics by corresponding serial number (used by the U.S. Census as an identification number) and dropped the mismatched observations. The combined sample was used to model typical home care workers in NYS and conduct cost-benefit analysis.

¹ US Census Bureau. (n.d.). American Community Survey (ACS). Retrieved April 15, 2018, from <https://www.census.gov/programs-surveys/acs/data/pums.html>

Table 1: American Community Survey 2016 Public Use Microdata Sample Populations

	PUMS 2016 Housing Records	PUMS 2016 Population Records	Combined Sample Records
Number of Observations	92,909	196,104	196,104

Homecare workers, by definition, are home health aides (SOC 311011) and personal care aides (SOC 399021). However, the ACS PUMS occupation code only enabled us to restrict the observations to personal care aides (SOC 399021) and nursing, psychiatric, and home health aides (SOC 311010) employed in NYS by using occupation code and state code. Since home care workers do not include nursing and psychiatric, to analyze each cost and benefit for home health aides, we multiplied the results with the percentage of home health aides employed by the total employed nursing, psychiatric, and home health aides in NYS. The combined sample records were used to approximate the true characteristics distributions for home care workers. For example, by analyzing the combined sample, we are able to understand their gender distribution, education distribution, citizenship distribution, race distribution, education attainment distribution, and income distribution.

Table 2: ACS 2016 Homecare Worker Sample Populations

	Personal Care Aides	Nursing, Psychiatric, and Home Health Aides	Combined Sample Records
Number of Observations	1,085	2,462	3,547

The employment number (*Ei*) was obtained from the Occupational Employment Statistics from the U.S. Bureau of Labor Statistics². There were 156,830 personal care aides and 282,570 nursing, psychiatric, and home health aides (61.5% were home health aides) employed in NYS in 2016.

	Employed	Employed per 1,000 jobs	Mean Hourly Wage (\$)	Mean Yearly Wage (\$)
Personal Care Aides	156,830	17	12.27	25,510
Home Health Aides	173,830	19.11	11.61	24,150
Psychiatric Aides	5,900	0.65	19.86	41,310
Nursing Assistants	98,040	10.78	16.49	34,300
Orderlies	4,800	0.53	17.13	35,640
Total	439,400			

From the government’s perspective, costs will be government expenditures and benefits will be any savings from government expenditures and increased tax revenue. If the NYS Office of Aging wants to recruit more home care workers by hiring them as full-time employees with minimal annual earnings, the cost is defined as increased payment to home care workers through Medicaid/ Expanded In-home Services for the Elderly (tax revenue expenditure) in NYS.

² May 2016 Occupation Profiles. (2017, March 31). Retrieved April 15, 2018, from https://www.bls.gov/oes/2016/may/oes_stru.htm#31-0000

We assume that the wage distribution among home personal care aides and nursing, psychiatric, and home health aides from the 1-year ACS sample data closely matches the actual wage distribution among home health aides/personal care aides in New York State. We set three thresholds of minimal annual earnings (\$25,000; \$30,000; \$35,000) to conduct a sensitivity analysis. Comparing the cost-benefits analysis under different thresholds will be helpful to find the most cost-effective amount of minimal annual earnings for home care workers.

Using the wage distribution in the sample data, we can know the percentage of individuals that earned less than the threshold annually (P_i). Then we increased their annual earnings to a certain threshold and calculated the average increased payment (M_i). The total cost is calculated by the following equation.

$$\text{Total Cost} = \sum E_i \times P_i \times M_i$$

where i refers to two different occupations (personal care aides or nursing, psychiatric, and home health aides).

E_i multiplied by P_i is the number of employed personal care aides or nursing, psychiatric and home health aides multiplied by the percentage of individuals that earned less than each threshold of minimal annual earnings. This number is then multiplied by the average increased payment which generates the total cost. Since the original estimated cost is the cost for increased payment to nursing, psychiatric, and home health aides, we adjusted it by a factor of 61.5% to reflect the estimated cost for home health aides only.³

³ For example, under \$25K threshold, the total cost will be calculated as E(nursing, psychiatric and home health aides)*P(nursing, psychiatric and home health aides that earn less than 25K)*M(average increased payment for nursing, psychiatric and home health aides under 25K threshold)*61.5%+E(personal care aides)*P(personal care aides earn less than 25K)*M(average increased payment for personal care aides under 25K threshold)

Four equations have been developed for analyzing the potential benefits of raising wages for home health care workers.

From the government's perspective, one of the potential benefits may be the reduced costs of social benefit payments to home health aides, if their incomes rise, and are sustained, above benefit eligibility thresholds. Based on the 2016 eligibility criteria, we calculated the percentage of individuals who participated in each social safety net program but would no longer be able to participate in each social safety net program with increased annual earnings (P_i^t). The average expenditure of each social safety net program (M_i^t) is obtained from the NYS official website. Again, the employment statistics (E_i^t) were obtained from the Occupational Employment Statistics from the U.S. Bureau of Labor Statistics.⁴ The total benefit is calculated by the following equation:

$$\textit{Reduction of Social Safety Net Payments} = \sum E_i^t \times P_i^t \times M_i^t$$

where t refers to different social safety net programs and i refers to two different occupations.

The product of E_i^t multiplied by P_i^t is the number of employed personal care aides or nursing, psychiatric and home health aides that are ineligible for a certain social safety net program under each threshold of minimal annual earnings. This number multiplied by the average expenditure of that social safety net program generates the reduction of that social safety net program. Since the original estimated benefit was the reduction in social safety net payments to nursing, psychiatric, and home health aides, we adjusted it by a factor of 61.5% to reflect the estimated benefit for home health aides only.⁵

⁴ May 2016 Occupation Profiles. (2017, March 31). Retrieved April 15, 2018, from https://www.bls.gov/oes/2016/may/oes_stru.htm#31-0000

⁵ For example, under \$25K threshold, the benefits will be calculated as E(nursing, psychiatric and home health aides)*P(percent increase in Medicaid ineligibility for nursing, psychiatric and home health aides under \$25K)*M(average expenditure for Medicaid)*61.5%+E(nursing, psychiatric and home health aides)*P(percent

Preventable Healthcare Expenditures = % of medical expenditure due to lack of home care services * Number of the elderly with disability/chronic diseases

Medical data, such as electronic medical records (EMRs) or electronic health records (EHRs), or data from the state-wide Delivery System Reform Incentive Payment (DSRIP) program may be used to calculate preventable healthcare expenditures. However, these datasets are confidential because of privacy issues. Since we were not able to obtain access to this data, we were unable to analyze this benefit either.

Improvement of Life Quality

Quality-Adjusted Life Years (QALYs) is a measure of the value of health outcomes, usually used in Regulatory Impact Analysis. We assume the elderly are in different health condition depending if they receive or do not receive enough home care services. QALYs can be used to assess the value in terms of quality life years lived.

QALYs would require us to conduct interviews or surveys to collect information about the health condition of the elderly in NYS. Quantifying the improvement of life quality is time-consuming and thus we were not able to complete it within the time constraints of our project.

increase in SNAP ineligibility for nursing, psychiatric and home health aides under \$25K)*M(average expenditure for SNAP)*61.5%+E(personal care aides)*P(percent increase in Medicaid ineligibility for home health aides under \$25K)*M(average expenditure for Medicaid)+E(personal care aides)*P(percent increase in SNAP ineligibility for home health aides under \$25K)*M(average expenditure for SNAP)

Results and Findings

Life Table Analysis

Table 1: Synthetic Life Table Analysis of Burnout Patterns for Home Health Workers, 2007 National Home Health Aide Survey Cohort

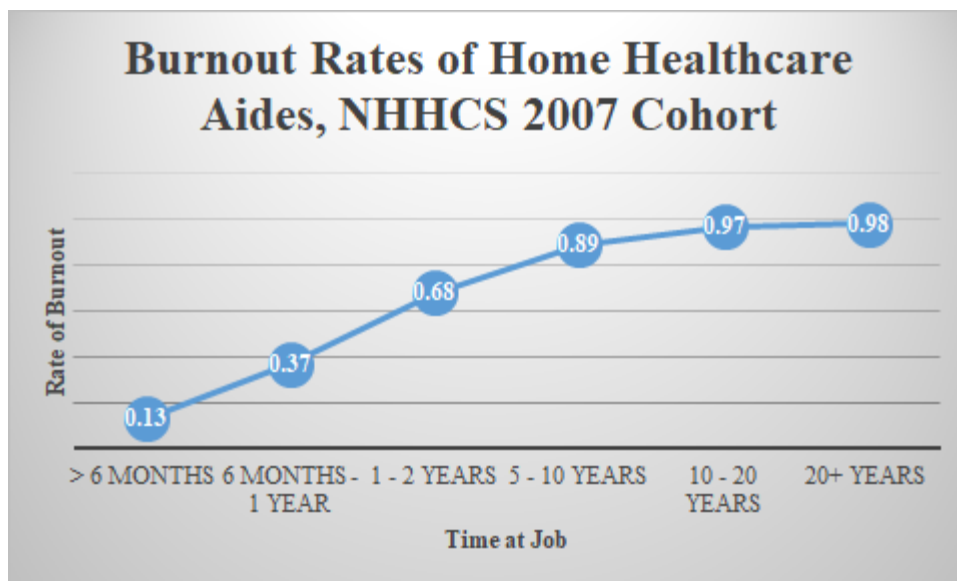
Time Spent Employed (x)	Number Entering the Interval (lx)	Proportion of Individuals who have Experienced Burnout (c)	Proportion of Individuals in Interval Experiencing Burnout	Population Surveyed in Age Interval
>6 Months	100,000	0.000000	19	75
6 Months to 1 Year	87,333	0.126667	21	66
1 to 2 Years	63,359	0.366405	39	138
2 to 5 Years	31,882	0.681185	207	660
5 to 10 Years	11,148	0.88852	181	652
10 to 20 Years	2,640	0.973605	273	1,241
More than 20 Years	2,116	0.978836	107	545

Table 4 applies a synthetic cohort life table analysis to employee data collected via the National Longitudinal Survey of Youth 1979 Cohort to illustrate patterns of welfare utilization by direct care workers. Based on rates observed in each age band, period rates were constructed for a hypothetical cohort of 100,000 home health aides. This allows us to observe rates of survival until “burnout” is experienced based on the rates observed in the 2007 NHHCS cohort, illustrating both interval-specific rates and cumulative rates for the

entire hypothetical cohort. Column 1 presents the age intervals as defined by the NHHCS in question B4. Column 2 indicates how many home health aides in a hypothetical cohort of 100,000 individuals would experience burnout as defined previously. Column 3 indicates the rate of burnout experienced by individuals within that age interval. Columns 4 and 5 show the actual number of individuals within the NHHCS survey population who experienced burnout within their age intervals and the total actual population within that age interval.

Results from the life table indicate that burnout is experienced by an extremely high number of individuals in the synthetic cohort, with 97.8 percent of the population experiencing the event by the end of the observed period. Columns 2 and 3 illustrate significant rates of burnout among home healthcare aides, with 89 percent of the synthetic cohort experiencing burnout within the first five years of employment. Increases of at least 10 percent or more can be observed for all intervals until this five-year threshold is reached, at which point the rate of burnout slows significantly. The increase in the proportion of the population experiencing burnout is illustrated in Figure 1 below.

Figure 1: Burnout Rates of Home Healthcare Aides



Of note is that 12.6 percent of the synthetic cohort experiences burnout within the first six months, with that number increasing by twenty to 36.6 percent of the synthetic cohort population by the end of the first year. By the end of the second year, well over half of the synthetic cohort (68.1 percent) has experienced burnout. Overall, results from the synthetic

cohort would indicate that burnout is a very common event among the 2007 NHHCS cohort, and that it more frequently occurs early in the life cycle of employment.

Table 2: Total Government Insurance Utilization by Home Healthcare Aides, NHHAS 2007 Cohort

Time Spent Employed	Number Entering Interval	Proportion signed up for Government Insurance	Proportion of Individuals in Interval on Government Insurance	Population Surveyed in Age Interval
<i>x</i>	<i>lx</i>	<i>c</i>	<i>nDx</i>	<i>nNx</i>
>6 Months	100000	0	13	75
6 Months to 1 Year	91333.333	0.08666667	11	66
1 to 2 Years	83722.222	0.16277778	19	138
2 to 5 Years	72937.665	0.27062335	92	660
5 to 10 Years	50318.793	0.49681207	72	652
10 to 20 Years	31758.583	0.68241417	118	1241
More than 20 Years	15892.737	0.84107263	39	545

Table 2 shows the cumulative prevalence of government insurance utilization by home healthcare aides based on the NHHAS 2007 cohort. By the end of the observed period, 84 percent of the population had enrolled in government insurance at some point during their time working as home health aides. Utilization is low in early intervals, with only 8 percent of the population utilizing government insurance at the end of the first six months and increases in utilization prevalence picking up at the ‘5 to 10 Years’ interval and after. This indicates a potential lack of incentives for newer home healthcare aides to enroll in health insurance more generally. As the NHHAS was conducted between 2007 and 2008, these rates do not consider expansions of government insurance programs such as Medicaid that following the passage of the Affordable Care Act. Changes in rates over time are illustrated in Figure 2 below.

Figure 2: Total HHA Government Insurance Utilization Rates

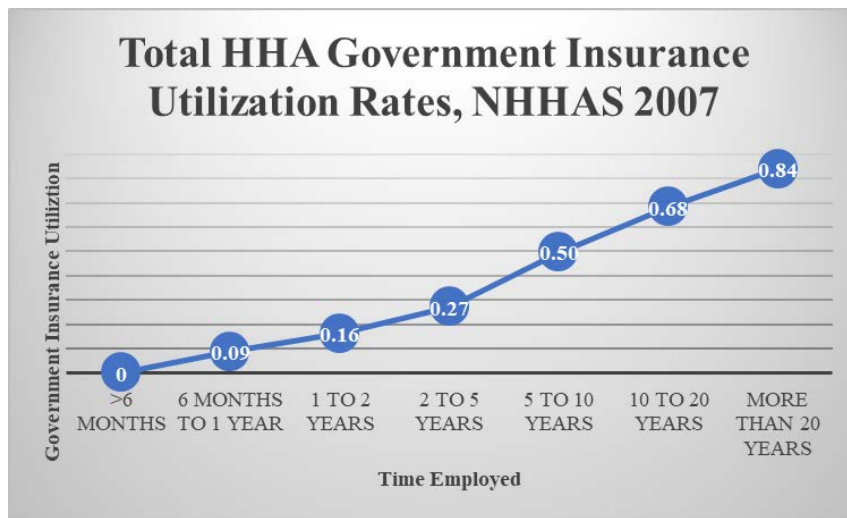


Table 3: Total TANF Utilization by Home Healthcare Aides, NHHAS 2007 Cohort

Time Spent Employed	Number Entering Interval	Proportion signed up for TANF	Proportion of Individuals in Interval on TANF	Population Surveyed in Age Interval
x	l_x	c	nDx	nNx
>6 Months	100000	0	16	75
6 Months to 1 Year	89333.333	0.11	8	66
1 to 2 Years	83919.192	0.16	26	138
2 to 5 Years	69469.53	0.31	111	660
5 to 10 Years	44793.953	0.55	180	652
10 to 20 Years	17219.016	0.83	282	1241
More than 20 Years	4831.8667	0.95	93	545

Table 3 shows the cumulative prevalence of TANF utilization by home healthcare aides based on the NHHAS 2007 cohort. By the end of the observed period, 95 percent of the population had utilized TANF at some point during their time working as home health aides. Increases in utilization prevalence picked up between the ‘1 to 2 Years’ and ‘2 to 5 Years’ intervals, increasing from 31 percent utilization to 55 percent utilization, and increasing to 83 percent utilization by the end of the ‘5 to 10 Years interval. Changes in rates over time are illustrated in Figure 3 below.

As TANF’s structure selects for a specific category of individuals, and the high levels of participation in it among individuals within the direct care industry indicates that a notable segment of individuals within the direct care industry’s labor cohort were/are individuals typically identified by social safety net programs as being at-risk of extreme levels of poverty

and in need of forms of direct aid. Specifically, a large segment of the labor cohort is composed of single women with children who made an annual income low enough to qualify for TANF.

Figure 3: Total HHA TANF Utilization Rates

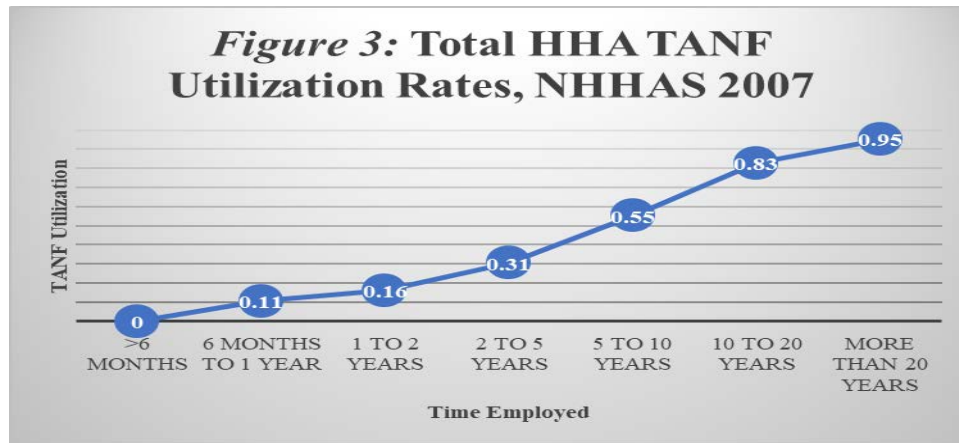


Table 4: Total WIC Utilization by Home Healthcare Aides, NHHAS 2007 Cohort

Time Spent Employed	Number Entering Interval	Proportion signed up for WIC	Proportion of Individuals in Interval on WIC	Population Surveyed in Age Interval
x	l_x	c	nD_x	nN_x
>6 Months	100000	0.00	42	75
6 Months to 1 Year	72000	0.28	24	66
1 to 2 Years	58909.091	0.41	66	138
2 to 5 Years	36172.249	0.64	331	660
5 to 10 Years	12024.993	0.88	348	652
10 to 20 Years	2591.4998	0.97	501	1241
More than 20 Years	427.77778	1.00	149	545

Table 4 shows the cumulative prevalence of WIC utilization by home healthcare aides based on the NHHAS 2007 cohort. By the end of the observed period, 100 percent of the population had utilized WIC at some point during their time working as home health aides. WIC utilization is prevalent from the end of the ‘>6 Months’ interval, with 28 percent of the population having utilized the program and increases regularly by a large percentage until the end of the ‘2 to 5 Years’ interval. It continues to climb throughout the observed period (more than 20 years). This indicates that the services and resources provided by WIC are highly demanded by workers within the home healthcare industry. Changes in rates over time are illustrated in Figure 4 below.

Figure 4: Total HHA WIC Utilization Rates

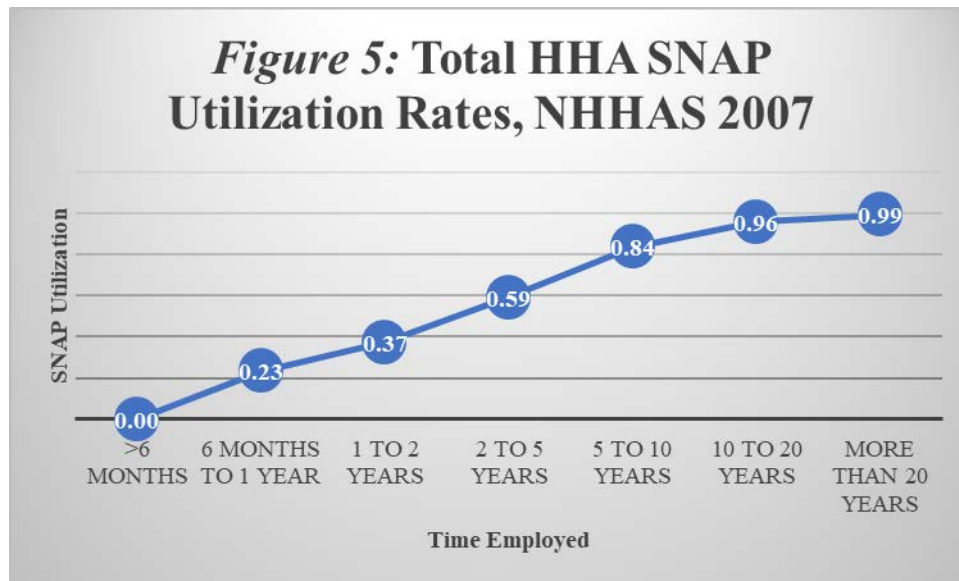


Table 5: Total SNAP Utilization by Home Healthcare Aides, NHHAS 2007 Cohort

Time Spent Employed	Number Entering Interval	Proportion signed up for SNAP	Proportion of Individuals in Interval on SNAP	Population Surveyed in Age Interval
x	l_x	c	nDx	nNx
>6 Months	100000	0.00	35	75
6 Months to 1 Year	76666.667	0.23	24	66
1 to 2 Years	62727.273	0.37	58	138
2 to 5 Years	40941.753	0.59	270	660
5 to 10 Years	16100.689	0.84	310	652
10 to 20 Years	3909.1561	0.96	541	1241
More than 20 Years	594.59855	0.99	194	545

Table 5 shows the total SNAP utilization by home healthcare aides surveyed in the NHHAS 2007 cohort. By the end of the observed period, 99 percent of the population had utilized SNAP at some point during their time working as home health aides. SNAP utilization is prevalent from the end of the '>6 Months' interval, with 23 percent of the population having utilized the program, and increases regularly by large percentage point amounts until the end of the '2 to 5 Years' interval. This indicates that the services and resources provided by SNAP are highly demanded by workers within the home healthcare industry. Changes in rates over time are illustrated in Figure 5 below.

Figure 5: Total HHA SNAP Utilization Rates

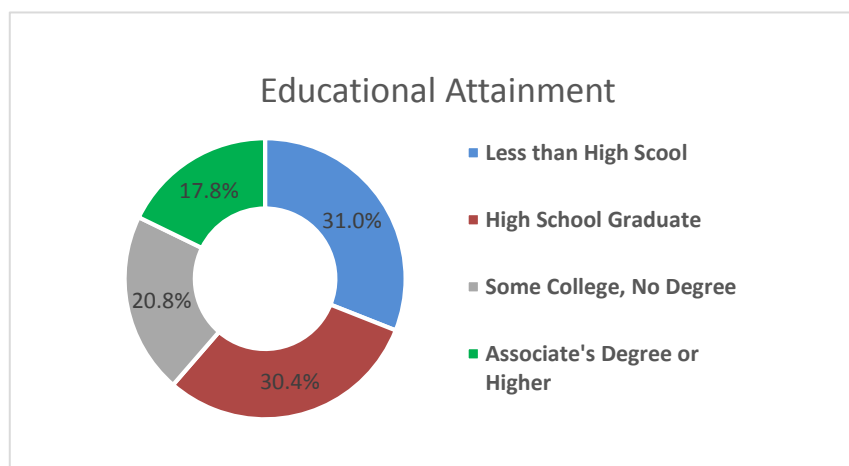
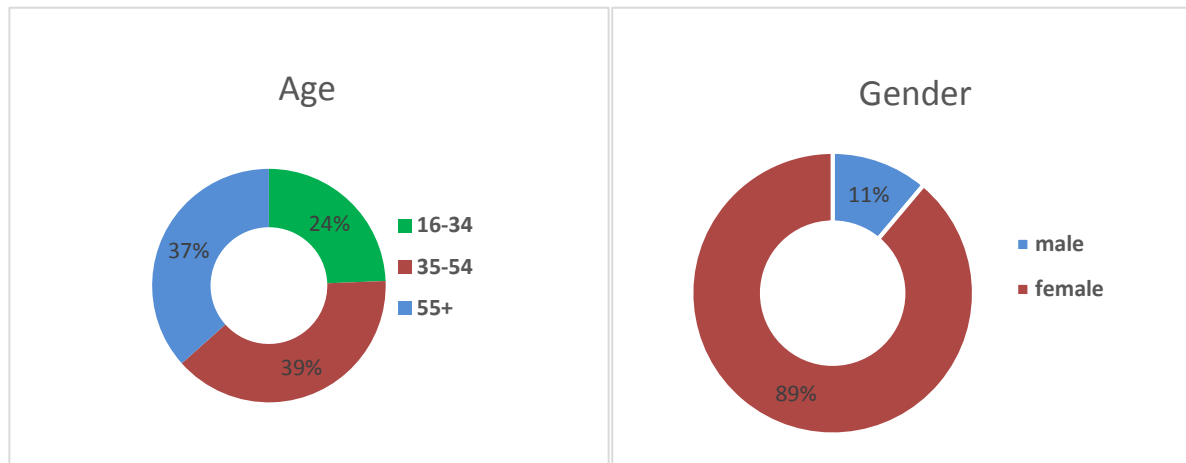


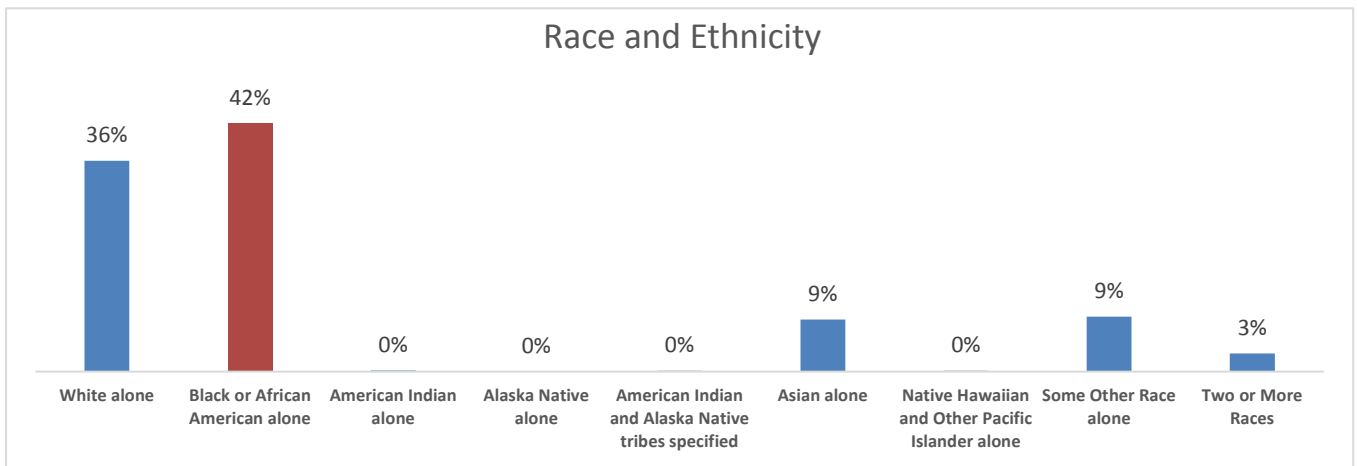
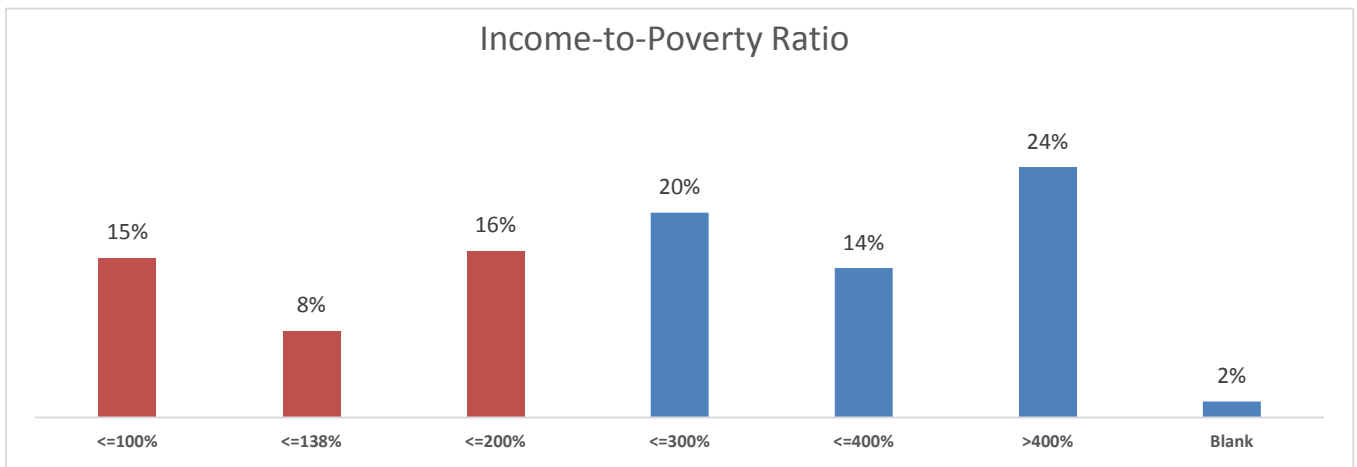
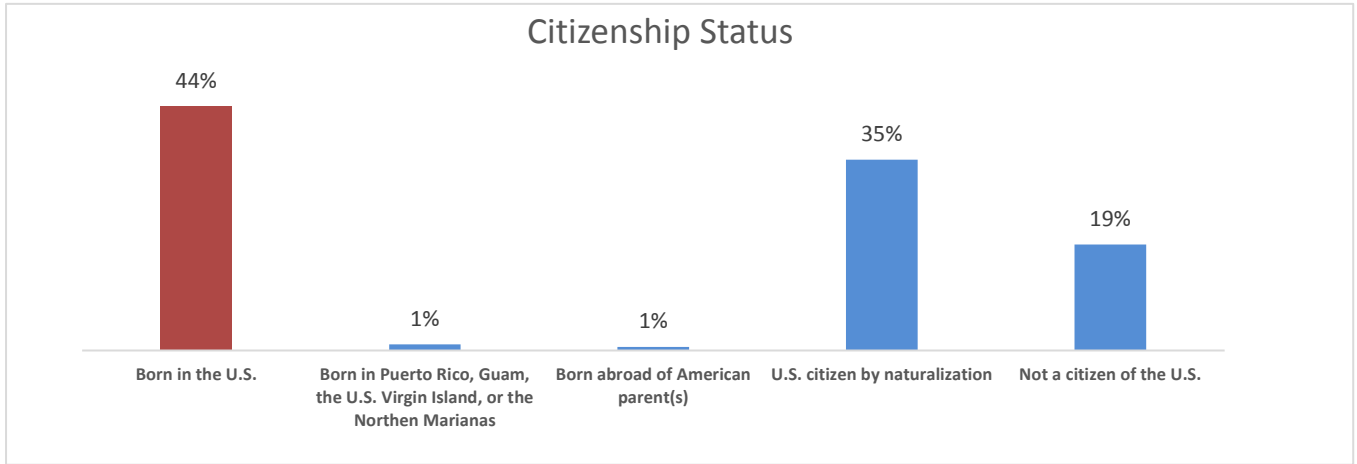
Given the workload of many individuals in the direct care industry, the prevalence of enrollment in social safety net programs is incredibly high. This indicates a potential occupational penalty for direct care work compared to other potential careers within the healthcare sector. This occupational penalty and lack of access to basic needs may contribute to the high rates of burnout indicated in Table 1 and Figure 1. The 100 or near-100 percent likelihood of having to utilize nutrition programs such as SNAP and WIC indicate a particularly high demand for nutrition and childcare services among home healthcare aides within the NHHAS 2007 cohort. This demand should be kept in mind when considering potential work-related benefits to extend to the home healthcare workforce

Cost-Benefit Results

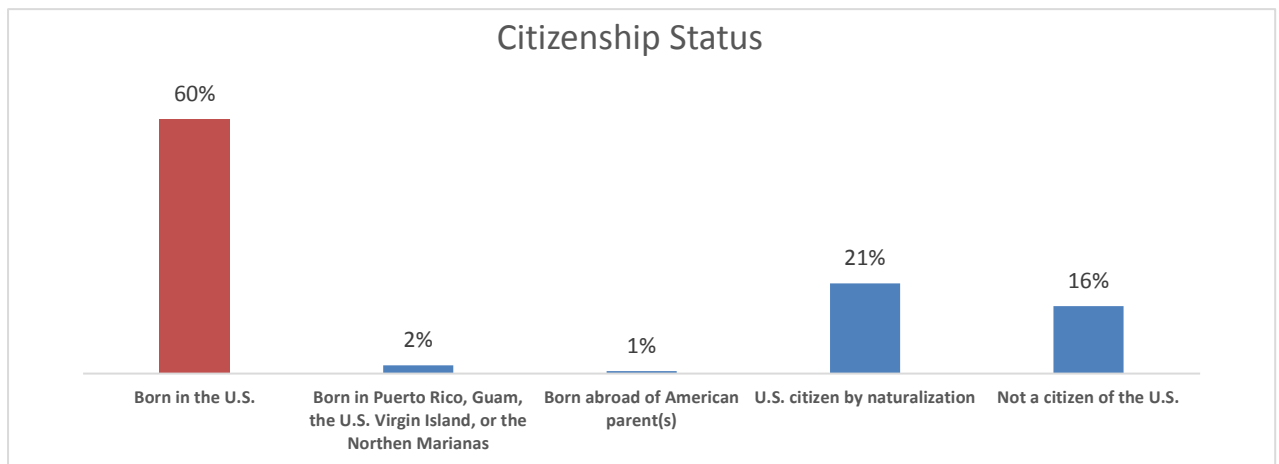
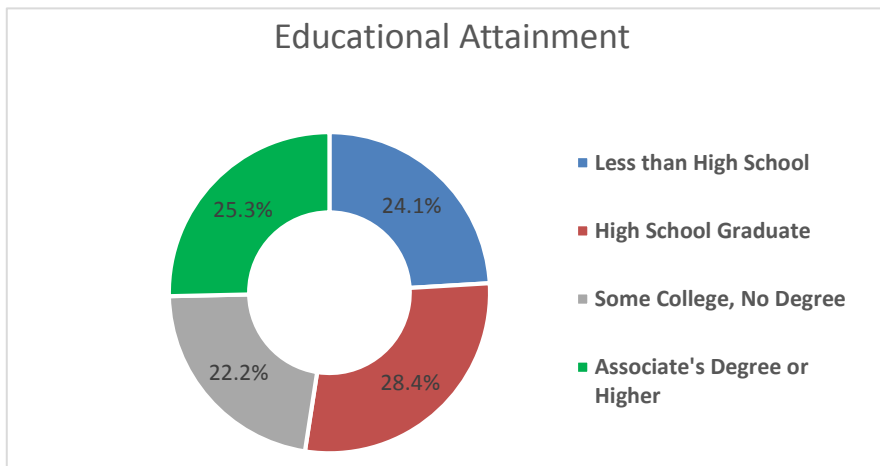
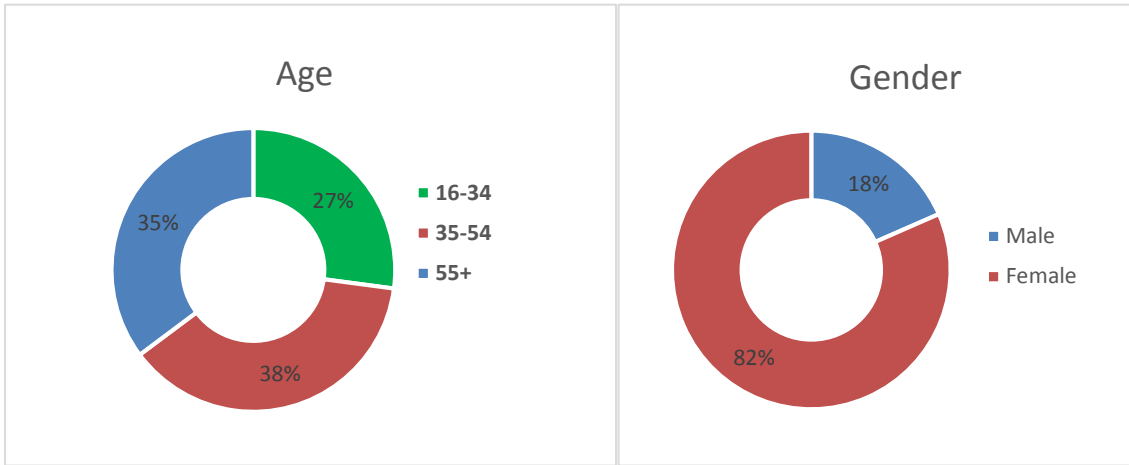
We use combined sample records from the American Community Survey (ACS) in 2016 to describe demographic, education, and income characteristics of typical personal care aides and nursing, psychiatric, and home health aides in New York State.

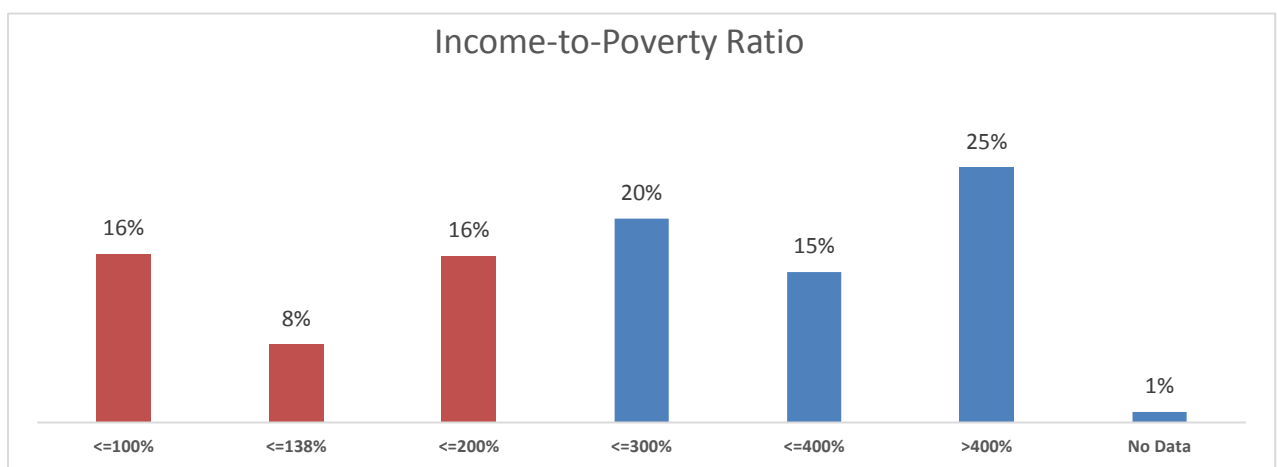
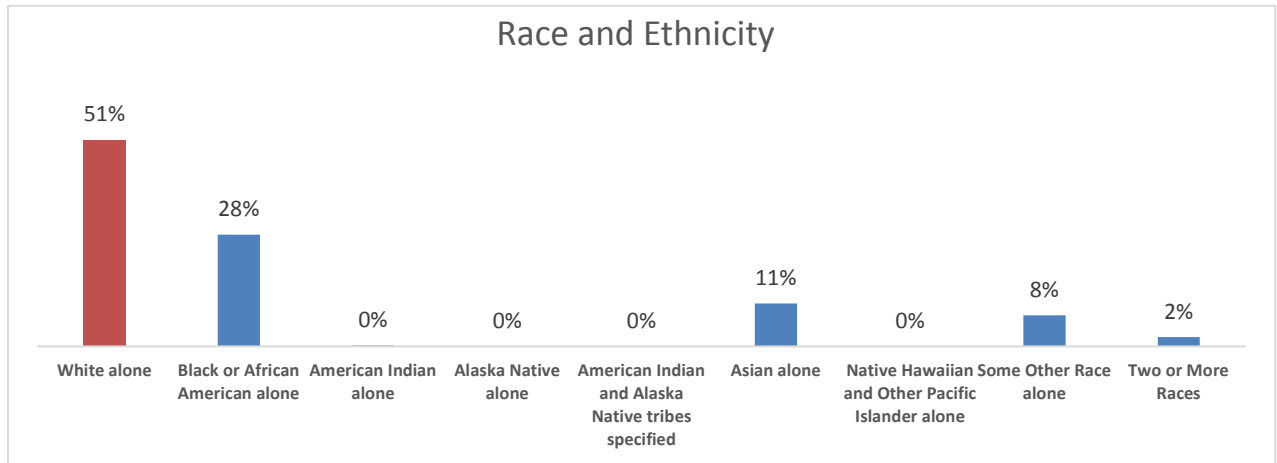
Demographic Information for Home Health Aides





Demographic Information for Personal Care Aides





Based on this data, a typical home health aide would be a middle-aged, black or African American woman who was born in the USA, with a regular high school diploma, 39% of them earn less than 200% poverty line. These home health aides work an average of 35.5 hours per week, earning \$21,276 annually. Meanwhile, a typical personal care aide according to this data would be a middle aged white woman who was born in the USA, with a regular high school diploma, 40% of them earn less than 200% poverty line. These personal care aides work an average of 34.9 hours per week and earn \$19,053 annually.

156,830 personal care aides were employed in New York State as of 2016. 56.22 percent of these individuals earned less than \$25,000 annually, 63.04 percent earned less than \$30,000 annually, and 70.32 percent earned less than \$35,000 annually. If the government decided to increase their annual wage income to \$25,000, \$30,000, or \$35,000, the estimated

costs to the State of New York for this increase would be \$1.081 billion, \$1.561 billion, or \$2.102 billion respectively.

173,830 home health aides were employed in New York State as of 2016. 49.35 percent of these individuals earned less than \$25,000 annually, 58.33 percent earned less than \$30,000 annually, and 66.17 percent of them earn less than \$35,000 annually. If the government decided to increase their annual wage income to \$25,000, \$30,000, or \$35,000, the estimated costs to the State of New York for this increase would be \$613 million, \$909 million, or \$1.25 billion respectively.

Total costs are currently estimated at \$1.694 billion, \$2.47 billion and \$3.352 billion if NYS increased their annual wage income to \$25,000, \$30,000, or \$35,000 respectively.

Table 6: Total estimated costs of annual wage increases for home healthcare workers

Annual Wages (\$)	Home Health Aides (Million \$)	Personal Care Aides (Million \$)	Total Benefit (Million \$)
25,000	613	1,081	1,694
30,000	909	1,561	2,470
35,000	1,250	2,102	3,352

Due to time constraints and limitations on the data sources that our team was able to access, we were only able to estimate potential benefits in savings from two means-tested social safety net programs targeting low-income populations: Medicaid and the Supplemental Nutrition Assistance Program (SNAP). HINS4 and FS are two variables in ACS PUMS reflecting whether the individual was in the Medicaid or SNAP.

The percentages of home care workers that were no longer able to participate in Medicaid or SNAP with increased annual earnings are shown in the following tables.

Table 7: Percent increase in Medicaid ineligibility following increase in annual earnings

	\$25,000	\$30,000	\$35,000
Personal care aides	20.68%	21.82%	22.84%
Home health aides	16.81%	18.18%	19.84%

Table 8: Percent increase in SNAP ineligibility following increase in annual earnings

	\$25,000	\$30,000	\$35,000
Personal care aides	11.14%	12.27%	14.20%
Home health aides	9.55%	11.12%	13.82%

Benefits from these two social safety net programs are \$582 million, \$622 million and \$665 million if the government increased their **annual income** to at least \$25,000, \$30,000, and \$35,000 respectively. Please note cost and benefits should be further adjusted. There are additional costs for government to provide workfare for full-time home care workers and reduction of training costs if the increased annual earnings for home care worker results in lower burnout rate. Benefits should be discounted because an increase in wage income does not mean an increase in total income. They may experience a benefit cliff, where their total income drops (even though wages increase) due to a drop in benefits and corresponding increase in costs of food and health care.

Table 9: Potential Benefits of Medicaid Savings

Annual Wages (\$)	Home Health Aides (Million \$)	Personal Care Aides (Million \$)	Total Benefit (Million \$)
25,000	274	304	578
30,000	296	321	617
35,000	323	336	659

Table 10: Potential Benefits of SNAP Savings

Annual Wages (\$)	Home Health Aides (Million \$)	Personal Care Aides (Million \$)	Total Benefit (Million \$)
25,000	2.3	2.4	4.7
30,000	2.7	2.7	5.4
35,000	3.3	3.1	6.4

Recommendations

Cost-Benefit Analysis Recommendations

Due to the breadth of potential benefits, our team was not able to conduct a full analysis of all potential policy benefits. Benefits, such as increased state and local consumption, preventable healthcare expenditures and improvement of life quality, remain to be analyzed in the future. From our current analysis, the reduction of two social safety net programs payment (Medicaid and SNAP) to home care workers only offset 1/3 to 1/5 cost of increased payment to home care workers.

Since our goal is to examine whether the costs of raising wages can be offset through reduction of costs related to programs, and increased state earning (income tax earned) through increased consumption, analysis of other potential benefits needs to be conducted in the further. Analysis that assesses a larger number of benefits will be more helpful to offset the cost. Therefore, we recommend prioritizing analysis on other social safety net programs with larger scope and larger average expenditures as well as analysis on preventable healthcare expenditures because of high medical costs.

Table 11: Increasing Rate of Cost and Benefits

	\$25,000 to \$30,000	\$30,000 to \$35,000
Cost	45.8%	35.7%
Benefit (Medicaid)	6.7%	6.8%
Benefit (SNAP)	14.9%	18.5%

Since costs increase more rapidly than the benefits in this analysis, if you want to illustrate that the benefits far exceed the cost, we recommend researchers conduct a full benefits analysis for the \$25,000 threshold of minimal annual earnings for home care workers.

If the results of future analysis are not promising, we recommend shifting from cost-benefit analysis (CBA) to the social welfare function (SWF). The SWF framework conceptualizes the status quo and each policy alternative as a pattern of well-being across the population of concern. CBA uses money as the metric for gauging policy effects on each individual, but money has “diminishing marginal utility”⁶. The SWF approach corrects for the diminishing marginal utility of money by using an appropriately constructed measure $w(.)$ of individual well-being as the indicator of how well each person is doing, and how much he or she stands to gain or lose from a given policy. Comparing with program spending money on public, money spent on low-income home care workers and elderly in need yields more utility gain.

Survey Development Recommendations

Like the NHHAS 2007, this survey would be structured as a multistage probability sample survey of home health aides designed to provide statewide estimates of home health aides employed by agencies that provide home health and/or hospice care.

⁶ A \$10,000 increase in the money holdings of a millionaire is not the same, in well-being terms, as a \$10,000 increase in the holdings of someone with average income: the millionaire gains less in welfare

Home health aides would be considered eligible to participate in NHHAS if they are directly employed by the sampled agency and assisted clients in activities of daily living (ADLs), including bathing, dressing, transferring, eating, and toileting. This survey would ideally be administered to aides during their nonworking hours by interviewers utilizing computer-assisted telephone interviewing (CATI) systems or other recording/documentation software to collect data. The survey instrument should include sections on recruitment, training, job history, family life, management and supervision, client relations, organizational commitment and job satisfaction, workplace environment, work-related injuries, and demographics based on the questions in the NHHAS. A reference to this questionnaire is provided in the bibliography of this report for further reference.

Sample Design

The proposed survey would be a two-stage probability sample design with home care agencies within New York sampled first and a random selection of aides from each of the participating sampled agencies sampled second.

Stage one should consist of the selection of a stratified probability sample of agencies representing the universe of agencies providing home health care and hospice services in the state of New York. This sample frame should specifically be stratified by the type of services the agency provided and MSA status. Within these primary strata, agencies should be sorted by census region, ownership, certification status, state, county, ZIP code, and size (number of employees). Then, a number of agencies should be systematically and randomly selected with probability proportional to size. The exact number of agencies within the random sample will be based on the number of agencies selected in stage one of the process. Stage two of the sampling process should consist of a random sample of up to six aides selected from each agency eligible for and participating in stage one of the survey.

Sampling Frame

The sampling frame can be constructed using three possible sources:

- 1.) The Centers for Medicare & Medicaid Services Provider of Services file of home health agencies and hospices
- 2.) State licensing lists of home health agencies compiled by the State of New York
- 3.) The National Hospice and Palliative Care Organization file of hospices

If multiple sources are used, the combined files should be matched and identified duplicates should be removed from the data.

Proposed Data Collection Procedures

The survey should be administered remotely utilizing computer-assisted interviewing software. The NHHAS questionnaire included 11 modules, the first of which was a screening section to determine eligibility. The questionnaire also included modules on recruitment, education and training, job history, family life, management and supervision, client relations, job satisfaction, job rating, work-related injuries, and socio-demographics. Home health aides selected for the survey should receive a packet of information in advance that includes descriptions of the study and a way for the home health aide to contact researchers and indicate willingness to participate in the study and to provide the best time and day to be reached. Follow up contacts should be made upon receiving a successful response to confirm availability for the survey.

Proposed Estimation Procedures

The statistics from the proposed survey will be based on a sample, meaning they will differ somewhat from the data that would have been obtained if a complete census had been taken using the same definitions, instructions, and procedures. However, the proposed probability design of the survey will permit the calculation of sampling errors. The standard error of a statistic is primarily a measure of sampling variability that occurs by chance because only a sample, rather than the entire population, is surveyed. The standard error also reflects part of the variation that arises in the measurement process but does not include any systematic bias that may be in the data or any other non-sampling error. According to the NHHAS researchers, the chances are about 95 in 100 that an estimate from the sample differs from the value that

would be obtained from a complete census by less than twice the standard error. Standard errors can be calculated using statistical software such as STATA as long as aspects of the complex sample design are taken into account.

The 2007 NHHAS survey uses a simple weighting equation to weight its survey data that can serve as a basis for weighting the proposed survey. In this equation, an estimator \hat{X} for any given population total X can be expressed as a weighted sum over all sample units, defined as:

$$\hat{X} = \sum_{\mathbf{u}} \mathbf{x}(\mathbf{u})W(\mathbf{u})$$

where \mathbf{u} represents a sampled unit, $\mathbf{x}(\mathbf{u})$ is the characteristics or response of interest for unit \mathbf{u} , and $W(\mathbf{u})$ is the final survey weight for sample unit \mathbf{u} . The final weight $W(\mathbf{u})$ for each sampled unit is the product of two components for a survey of home health aides:

- 1.) Inverse of the probability of selection for the survey.
- 2.) Nonresponse adjustment that adjusts for nonresponses to the survey.

Other Further Research and Next Steps: Increased State and Local Consumption

Increased consumption will add to tax revenues at the state and local levels. We assume home health care workers will spend most of their additional income on food, products and services from small business, transportation, and housing. Unfortunately, we did not find data that allows us to find how home care workers prefer to spend their additional earnings. A case study (survey) in Tompkins County will be helpful to reveal their preferences, and add to the understanding of the possible impacts related to additional income and benefits and potential increased consumption.

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