Deaf people and economic well-being: findings from the Life Opportunities Survey


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Points of Interest

- In 2015, one in six had some form of hearing loss in the UK.
- There is limited information about the relationship between hearing impairment and economic well-being in the UK.
- The research found that people with hearing impairment were significantly more likely to experience economic hardship and less likely to be employed than people without hearing impairment.
- The UK government has introduced several cuts to disability benefits since 2015, which are likely to worsen the economic hardship of people with hearing impairment.
- Efforts to address the economic hardship of people with hearing impairment are needed.

Introduction

Deafness or hearing loss is often described as being the ‘invisible disability’ because it is not immediately apparent if someone has hearing impairment unless a person has visible hearing aids or uses sign language (Davis, 2005; Shohet & Bent, 1998). This makes it difficult for people who are deaf or hard of hearing and the barriers they may experience to be recognized. Yet, deafness or hearing loss is the second most prevalent impairment in the United Kingdom (UK; Hearing Link, 2011).

In 2015, approximately 11 million people, one in six, were reported to have some form of hearing loss in the UK (Action on Hearing Loss, 2016). Approximately 6.4 million were 65 and above, and about 3.7 million were working aged (16-64). More than 800,000 people and approximately 135,000 working-aged people had severe or profound hearing loss (Knowsley Knowledge, 2015). By 2031, an estimated 14.5 million people are expected to have some form of hearing loss in the UK due to an aging population (Knowsley Knowledge, 2015).
Deaf and hard of hearing people are at greater risk of marginalization because of economic, environmental and institutional discrimination which exclude them from socioeconomic activities. Studies highlight that deaf and hard of hearing people typically leave school with fewer qualifications than hearing people, are less likely to further study and are more likely to find themselves in positions where they are not promoted (Luft, 2015; Winn, 2007). Also, according to a recent survey (Action on Hearing Loss, 2007), even among those who are employed, more than half of deaf and hard of hearing people (55%) reported feeling socially isolated at work and approximately one in four reported being harassed in their workplaces (26%), making it difficult for them to maintain paid work and remain economically independent.

As a result, like other disabled people, deaf and hard of hearing people experience high rates of poverty and economic exclusion (Conama & Grechen, 2002). However, although there are many studies that have examined the relationship between disability and poverty (e.g., Dobson et al., 2001; Emerson & Hatton, 2007; Parckar, 2008; Palmer, 2011; Parish et al., 2009), to our knowledge, there are no empirical analyses that have specifically examined the relationship between hearing impairment and economic well-being on a national scale in the UK. Most prior UK studies focus on deaf education (e.g., Powers, 1998; Powers, 2002) and deaf culture and community (e.g., Emond et al., 2015; Parasnis, 1998; McLaughlin, Brown, & Young, 2004). The purpose of this study is to address this gap in the literature and empirically examine the economic well-being of deaf and hard of hearing people in the UK. This study compares the economic well-being of people with and without hearing impairment on multiple dimensions. Despite the large population of people with hearing loss, there is limited information about their economic well-being in the UK. Hence, these findings can inform policy makers interested in ensuring the well-being of deaf or hard of hearing people and developing policies that better accommodate their needs. The present
study recognises the multiple identities associated with deafness and hearing loss, and hence the term deaf and hard of hearing was used throughout the study to encompass the broad spectrum of hearing loss, including those who are sign language users and who are oral.

**Background**

*Disabled People and Economic Well-Being*

Article 28 of the United Nations Convention on the Rights of Persons with Disabilities (CRPD) stipulates “the right of persons with disabilities to an adequate standard of living for themselves and their families”. The right to an ‘adequate standard of living’ for all has been long been established in international human rights law ever since the explication in Article 25(1) of the Universal Declaration on Human Rights in 1948 and remains at the fore of human rights. Yet, detailed guidance on what Article 28 of the CRPD means for policy and practice is unclear. The meaning of ‘an adequate standard of living’ has to be ascertained from the work of other human rights treaty bodies to date. The Committee which monitors the International Covenant on Economic, Social and Cultural Rights has clarified the meaning of “adequacy” as “to large extent determined by prevailing social, economic, cultural, climatic, ecological and other conditions” (ICESCR, General Comment 12, at para 7). Notwithstanding, the right to an adequate standard of living requires, at a minimum, that everyone shall enjoy the necessary subsistence rights: adequate food and nutrition, clothing, housing, medical care and social services, and the right to security in the event of, for example, unemployment, sickness, old age or other circumstances beyond an individual’s control.

Economic or material well-being is one facet of overall well-being (Office for National Statistics, 2014) and a contributing factor to achieving an adequate standard of living. The World Bank defined economic well-being as ‘the expenditure necessary to buy a minimum standard of nutrition and other basic necessities and a further amount that varies from country to country, reflecting the cost of participating in the everyday life of society’
The Organisation for Economic Co-operation and Development defined economic well-being as ‘person’s or family’s standard of living based on consumption possibilities and command of resources’ (Organisation for Economic Co-operation and Development, 2013: 2). The economic well-being of disabled people has been the subject of growing attention across the contexts of income, poverty, employment, and educational qualifications (see for example Coleman, Sykes, & Groom, 2013; House of Lords, 2016; Packar, 2008; Parish et al., 2009; MacInnes et al., 2014). Generally, the evidence suggests that disabled people are at risk of adverse economic outcomes and they are at greater risk of adverse economic effects in times of crisis (Livermore & Honeycutt, 2015).

Disabled people are more at risk of adverse economic outcome for a range of reasons, including reduced education and employment opportunities and elevated costs associated with living with impairments. For example, in 2014, 34% of UK disabled people were employed compared to 74% of nondisabled people (Labour Force Survey, 2015; Livermore & Honeycutt 2015). In addition, disabled people were twice as likely to have no educational qualification compared to nondisabled people (Labour Force Survey, 2015); consistently earned less (Burchardt, 2000; Meager & Higgins, 2011; Riddell et al., 2010); and were less likely to work in high status occupations (Burchardt, 2000; Meager & Higgins, 2011). Also, disabled people pay an estimated average £550 per month on disability-related extra costs (Scope, 2014). This can have the effect of pushing disabled people’s income below levels necessary for an adequate standard of living. More recently, disabled people’s economic well-being has also been under threat from proponents of austerity and the so-called benefits crisis (Grover, 2015; Cross, 2013).

However, one problematic issue with existing studies is that they assume homogeneity of disabled people’s experiences (Fordyce & Riddell, 2015). Much of the existing research has aggregated the disabled population, and neglected research on the
specific economic well-being of deaf or hard of hearing people – and indeed other impairment specific groups. Whilst identifying the commonalities of disabled people’s economic oppression is a critical lobbying tool, there is a need to acknowledge that different groups can be impacted in different ways and may experience different barriers in their quest for economic well-being.

Definitions of deafness and hearing loss

While many impairments generate extensive debate in relation to what is appropriate terminology, the case of deafness or hearing loss is unique given the centrality of linguistic difference (Corker, 1998; Gregory, 1995; Ladd, 1991; Padden, 1980; Padden & Humphries, 1988). Far from being merely a descriptive term, the word ‘deaf’ or ‘hearing loss’ encompasses a range of identity locations. Thus, to be ‘deaf’ or ‘hard of hearing’ does not imply a singular fixed identity.

The medical model views deafness or hearing loss as an individual pathological deficiency, which therefore validates the need for surgical or audiological interventions to restore hearing and speaking ability (Denmark, 1994; Sacks, 1990). Medical constructs of deafness or hearing loss are common, particularly with the ongoing need for audiology departments and the emergence of cochlear implants (Dant & Gregory, 1991). People who lose some or all of their hearing in later life after acquiring a mastery of spoken language may be more likely to identify with this medical model because they have already established their identity in the hearing world (Conama, 2004). Based on the medical model, being deprived of hearing is an undesirable trait that needs to be treated.

The social model in contrast views deafness or hearing loss as a difference rather than a deficit. As with the social model of disability, proponents of this model argue that deaf or hard of hearing people experience disability as a result of social exclusion and discrimination (Conama, 2004). The social model views disability from a minority identity context and
focuses on social and institutional changes than medical interventions. Proponents of this model view lack of access to the mainstream as the main problem, and stress the importance of deaf education and technological aids such as text telephones and captions on television programs to help deaf or hard of hearing people integrate into the mainstream hearing world.

The cultural-linguistic model views deafness or hearing loss as a distinct linguistic identity. The Deaf community itself is a very strong proponent of this model. Deaf with a capital ‘D’ is used to represent the cultural and linguistic identity and membership within this community (Conama, 2004). Here, Deaf persons are those who identify themselves as culturally deaf and Deaf people base their identity on shared experiences and collective values of the Deaf community. Deaf community membership is largely determined by cultural behaviors (usually sign language use) and beliefs and not by medical diagnosis. The cultural-linguistic model views deafness as neither a physical impairment nor disability, but as a separate socio-linguistic identity. There are deaf individuals who use sign language but do not self-identify with the Deaf community, as well as individuals who self-identify with the Deaf community but either do not use sign language or have no hearing loss. Yet deaf and hard of hearing people—whether or not culturally Deaf—have primarily been incorporated within the wider disability legislative, policy, and data collection framework as ‘disabled’ and not as a linguistic minority.

The economic well-being of deaf or hard of hearing people

The United Nations CRPD enumerates specific references to deaf and hard of hearing people and their rights. Article 9 of the CRPD stipulates that States Parties (i.e., signatories) should ensure disabled people, including deaf and hard of hearing people, have access to information and communication and provide “live assistance and intermediaries, including professional sign language interpreters”. Article 21 and 24 of the CRPD requires States Parties to take all appropriate measures to ensure that disabled people can exercise the right
to freedom of expression and opinion and the ways in which this should be achieved including “accepting and facilitating the use of sign languages”, and ensure that “the education of persons, and in particular children, who are blind, deaf or deafblind is delivered in the most appropriate languages and modes and means of communication, and in environments which maximize academic and social development”.

Despite the CRPD stipulations, deaf and hard of hearing people face greater risk of economic hardship than hearing people. The reasons for such higher risks of hardship among deaf and hard of hearing people is related to; the additional environmental and attitudinal barriers linked to the challenges of communicating in a hearing world (Fordyce et al., 2013); the institutional and systematic discrimination in the social fields of education and employment (Coles, 1997); and the low expectations and lack of access to information to make informed choices (Valentine & Skelton, 2007).

Qualitative research by Skellington Orr et al. (2006) has highlighted the barriers for deaf and hard of hearing adults to engage in socioeconomic interaction and feeling of isolation. Also, the deaf community can be closed and exclusionary (Skelton & Valentine, 2003). As a result, deaf and hard of hearing people who do not share the same level of sign language competence may feel even more isolated not being able to integrate into the hearing world but also into the Deaf community (Skelton & Valentine, 2003).

Employment is an important means of securing economic stability and independence. Deaf and hard of hearing people experience greater employment difficulties than hearing people, including higher unemployment rates, part-time employment, and lower earnings (Haualand & Allen, 2009; Luft 2015; National Deaf Children’s Society, 2014). According to the study from the Labour Force Survey (Office for National Statistics, 2006), the employment rate among deaf and hard of hearing people (63%) was lower than the general population (75%). Also, the full-time employment rate for deaf and hard of hearing people
was only 33%, compared to 50% for the general population (SignHealth, 2013). Further, a survey by the Royal National Institute for Deaf People (2006) explored barriers to, and experiences of, employment among deaf and hard of hearing people, and found that deafness was a significant barrier to finding work, and almost three quarters of respondents believed that being deaf and hard of hearing made it harder to find a job. Specifically, respondents reported that the employer’s attitude towards deaf and hard of hearing people was the largest barrier to finding a job, followed by lack of communication support and lack of suitable jobs. Even after gaining employment, over half of respondents felt socially isolated at work, a quarter felt subject to harassment, and over three quarters felt they were held back on their career path.

Further, deaf and hard of hearing people face difficulties accessing public services and resources to remain socially and economically independent (British Deaf Association, 2014; Harris & Bamford, 2001; Kyle et al., 2005; McCracken & Pettitt, 2011). These include lack of qualified interpreters, shortage of service and information delivered in sign language and general deaf awareness (Harris & Bamford, 2001; Kyle et al., 2005; McCracken & Pettitt, 2011). In the UK, issues have been raised about lack of qualified interpreters and sign language in public services. Deaf people have to rely on family and friends who are untrained in interpreting, which raises concerns regarding accountability, privacy and confidentiality (British Deaf Association, 2014; Kyle et al., 2005) In addition, the lack of deaf awareness and attitudes of staff can leave deaf and hard of people feeling frustrated and embarrassed when having to use public services and resulted in them not using the services again (Kyle et al., 2005).

Existing research reports that deaf and hard of hearing people face greater marginalization than hearing people and address factors that contribute to such marginalization. However, prior studies lack a robust empirical base and do not specifically
address economic well-being. As such, the proposed study was conducted to determine the association between hearing impairment and economic well-being in the UK.

**Method**

*Data*

Data for this study were drawn from the 2009/10 Life Opportunities Survey. The Life Opportunities Survey is the first social survey to explore disability in terms of social participation barriers that people in the UK experience (Cuddeford, Glen & Bulman, 2010). The survey follows the social model’s definition of disability and explores the extent of additional disadvantage experienced by people with impairments due to a range of social barriers, discrimination, lack of assistance and adjustments. The Life Opportunities Survey is designed as a longitudinal survey, and the follow-up 2012/14 Life Opportunities Survey data is expected to be released to the public in 2017.

The survey was carried out by the Office for National Statistics using face-to-face Computer Assisted Personal Interviewing (CAPI). A total of 37,500 households were randomly selected from the Postcode Address File. Systematic single-stage probability sampling was used to ensure that the sample distribution was representative of the national population. In each household, adults aged 16 and over were interviewed by a trained interviewer. British Sign Language interpreters were made available for respondents with hearing impairments to ensure equal chance of survey participation as non-impaired respondents.

The Life Opportunities Survey data was chosen for the present study because it is representative of the national population and includes several economic hardship measurements. British Sign Language interpreters were employed to ensure that sign language users and their responses are accurately included in the survey. The Life Opportunities Survey is the first and only major survey in the UK to explore the economic
hardship of deaf and hard of hearing people in multiple dimensions. The last major disability survey in the UK was the Family Resources Survey in 1996/1997, and between 1985 and 1988 the Office of Population Censuses and Surveys carried out national disability surveys (Office for National Statistics, 2011a). However, these lacked measurements and sample size to accurately estimate the economic well-being of people with hearing impairment. The Life Opportunities Survey includes a substantial number of people with hearing impairment (n=377) and not only includes traditional household income measurements but also subjective self-assessment of material hardships.

**Sample**

The sample for the study was working-aged individuals residing in the UK. Working-aged is defined as when someone is eligible to work full-time (40 hours a week) and until they are eligible for state pension. In the UK, working age was defined as between 16-59 for women and 16-64 for men when the Life Opportunities Survey was conducted (Topic Guide, 2009). The sample was stratified into individuals with and without hearing impairment. The analytic sample for this study included a total of 25,138 individuals (n=24,761 without hearing impairment, and n=377 with hearing impairment).

The demographic characteristics of each of the samples are presented in Table 1. Individuals with hearing impairment were on average 10 years older, had less Degree level education, were less likely to have dependent children and lived in smaller families than individuals without hearing impairments.

**Measures**

*Independent variable.* The independent variable for the present study was derived from the Life Opportunities Survey classification of respondents of whether the individual had a hearing impairment or not. Respondents were defined as having hearing impairment if they indicated having (1) moderate, severe or complete difficulties even with hearing aids (5
point scale: no difficulty; mild; moderate; severe; complete), and (2) their activities (i.e. conversing with others) were rarely, sometimes, often or always (5 point scale: never; rarely; sometimes; often; always) limited as a result. The present study used the Life Opportunities Survey definition of hearing impairment, and did not construct this variable. Thus, the study was not possible to distinguish between sign language users and non-sign language users or by different kinds of hearing impairment.

**Dependent variables.** Seven indicators of economic well-being and employment were examined: Financial loan payment (yes vs. no), severity of financial loan payment (heavy vs. slight or not a burden, difficulties in making ends meet (great or some difficulties vs. fairly or very easy), affordability to pay for unexpected but necessary expense of £500 or more (yes vs. no), employment status (employed vs. unemployed), employment type (full-time vs. part-time) and weekly total household income before tax. The study assessed for traditional household income measure as well as subjective assessment of material hardship to examine multiple dimension of economic well-being. The measurements were adopted from the Life Opportunities Survey questionnaire. Please see Life Opportunities Survey Questionnaire (Office of National Statistics, 2011b) page 42-43 for further details of how the questions were constructed and measured.

**Covariates:** Potential confounders that could affect economic outcomes were included as model covariates: gender (male vs. female), ethnicity (white vs. other ethnicity), and marital status (married vs. other), number of dependent children (continuous variable), age (continuous variable), household size (continuous variable), and education (Degree level qualification vs. Higher education below degree level vs. A-levels equivalent vs. O-level equivalent vs. no formal qualifications).

**Propensity score matching**
For the present study, propensity score matching was employed because of the highly skewed sample size (without hearing impairment 98.5% vs. with hearing impairment 1.5%). Ordinary regression models are commonly used for observational (non-randomized) studies to adjust for possible pre-existing group differences (Cepeda et al., 2003). However, this approach has two limitations. Regression models generally assume a linear relationship between covariates and the outcome. Although this assumption can be relaxed (i.e. using polynomials) the models fundamentally should be linear. A second problem involves distribution of the covariates. If the distribution of the covariates has little overlap (i.e. significantly different) between groups, regression models estimate values outside the observed range to form a comparison common value, and thus findings may be biased (Foster 2003). In our study, not only the covariate means differed between individuals with and without hearing impairment, but the distribution of covariates overlap relatively little (see Table 1, chi square and t-test results). An alternative to the regression model includes matching, which select a group of comparison participants who are similar to the participants of interest in terms of confounders. Two common matching techniques are covariate matching (also known as Mahalanobis metric matching) and propensity score matching (Stuart, 2010).

Covariate matching attempts to balance all covariates directly; however, in order to use covariate matching, the number of confounding variables must be relatively small. As the number of confounding variables increases, the sample size requirement increases exponentially. Propensity scores provide a method for matching on multiple confounding variables (Imbens & Rubin, 2015).

Rosenbaum and Rubin (1983) proposed propensity score matching. Propensity scores represent the predicted likelihood of being in a specific group, in this study, having hearing impairment based on the confounders. For example, a propensity score of 0.9 means that the
individual has a 90% predicted probability of having hearing impairment given the confounders. Propensity scores are computed using logistic regression, where the outcome variable is the binary variable representing groups (e.g., with and without hearing impairment) and the predictor variables are the confounders. Matching is then used to balance the two groups using the propensity scores. In this study, nearest neighbor matching with replacement technique was used to match the two groups (Caliendo & Kopeinig, 2005). Once the matched groups were created, standard statistical analyses were used to test for group differences on the outcome variable.

**Results**

**Bivariate Statistics**

Table 2 presents the unadjusted comparison of working-aged adults with and without hearing impairment in the UK. Overall, individuals with hearing impairments experienced greater economic hardship than individuals without hearing impairment.

Individuals without hearing impairment were more likely to live in households with financial loan than individuals with hearing impairment, but the difference was not statistically significant (56% vs. 52%). Among those with financial loans, individuals with hearing impairment were significantly more likely to have “heavy” financial loans than individuals without hearing impairment (27% vs. 21%, \( p < .05 \)).

Individuals with hearing impairment were significantly more likely to experience difficulties in making ends meet than individuals without hearing impairment (52% vs. 37%, \( p < .001 \)). Among those who reported experiencing difficulties in making ends meet, the majority of both groups reported “limited income” as their reason for having such difficulties. However, a significantly greater percentage of individuals with hearing impairment reported ‘limited income’ than individuals without hearing impairment (83% vs. 78%, \( p < .05 \)). Also, more than double the percentage of individuals with hearing impairment reported having
‘health conditions, illness, or impairment’ (18% vs. 8%, $p < .001$) and ‘disability’ (12% vs. 4%, $p < .001$) as their reasons for difficulties in making ends meet than individuals without hearing impairment.

Similarly, significantly fewer individuals with hearing impairment (52%) were able to afford to pay for unexpected but necessary expense of £500 or more than individuals without hearing impairment (67%, $p < .001$).

Individuals without hearing impairment were significantly more likely to be employed than individuals with hearing impairment (72% vs. 51%, $p < .001$). Individuals without hearing impairment were also more likely to work full-time than individuals with hearing impairment (76% vs. 73%); however, there was no statistically significant difference between the two groups.

Finally, regarding household income, whilst individuals without hearing impairment reported an average weekly pre-taxed total household income of £814, individuals with hearing impairment reported £606 ($p < .001$).

**Propensity Score Statistics**

Prior to matching, significantly differences existed between individuals with and without hearing impairments in nearly all baseline demographic covariates. These differences were treated using propensity score matching and the two groups were balanced (see Table 3) as noted above.

<< INSERT TABLE 1 ABOUT HERE>>

Propensity score statistics indicate that individuals with hearing impairment were generally more likely to experience economic hardship and less employment opportunities compared to individuals without hearing impairment after matching all model covariates. There were no statistically significant differences in the likelihood of having a financial loan or having a severe loan payment amount. However, individuals with hearing impairment
were significantly more likely to experience difficulties in making ends meet than individuals without hearing impairment \(B=0.12, p<.01\), and were less likely to afford to pay for unexpected but necessary expense of £500 or more \(B=-0.14, p<.001\). Also, in regard to employment opportunities, individuals with hearing impairment were significantly less likely to be employed than individuals without hearing impairment \(B=-0.18, p<.001\). They were also less likely to work full time \(B=-0.05\), but this difference was not statistically significant. Lastly, individuals with hearing impairment earned approximately £105 significantly less per week than individuals without hearing impairment \(p<.001\) even after accounting for all model covariates.

Discussion

This study compared the economic wellbeing of people with and without hearing impairment in the UK using a nationally representative sample from the 2009/10 Life Opportunities Survey. The findings reveal that overall people with hearing impairment were significantly more likely to experience economic hardship and less likely to be employed than people without impairment. Even after accounting for other demographic characteristics, significant economic disparities persisted between people with and without hearing impairment.

Before discussing the implications, we considered the study’s limitations. First, the study relies on self-reported data, which are subject to recall bias. While this is an important limitation there is no evidence that people with hearing impairment are more likely to report biased responses than people without impairments. Second, the study is cross-sectional and thus, cannot infer causality. Further longitudinal research is needed to more fully investigate the relationship between hearing impairment and economic well-being. The latest 2012/14 Life Opportunities Survey panel data is expected to be released to the public in
Future research should investigate how hearing impairment and material well-being interact overtime and at different life stages. Third, the study was neither able to distinguish sign language users and non-sign language users nor analyze hearing impairment by severity due to lack of data and sample size. The Life Opportunities Survey does not include information about whether the respondent uses sign language and/or hearing aids. Also, due to lack of sample size, the study could not analyze hearing impairment by severity (‘moderate difficulties’ n=320; ‘severe difficulties’ n=53; ‘complete difficulties’ n=4). People with higher degree of impairment are known to experience more economic hardship than people with lower degree of impairment levels (Berthoud, 2003). Future research should focus on investigating whether and to what extent material well-being differs by different types and degrees of hearing impairment.

Despite these limitations, this study has important strengths. It employed a large, nationally representative sample. British Sign Language interpreters were employed to ensure that sign language users and their responses were accurately included in the survey. Second, multiple economic indicators, including employment indicators were assessed. To complement traditional income analyses, which overlook the variability in individual’s needs, subjective material hardship assessment variables were incorporated in the study. Third, the determination of hearing impairment in this study was based on the social model, which views deafness and hearing impairment in relation to social contexts, rather than as a result of individual medical conditions. The purpose of the study was to investigate the association between impairment and economic well-being and explore whether and to what extend people with hearing impairment experience additional financial difficulties compared to people without hearing impairment. It is the first study in the UK to empirically examine the economic well-being of people with and without hearing impairment on a national scale.
The present study findings have important implications for UK policy makers. First, our findings indicate marked economic disparities between deaf or hard of hearing people versus hearing people in the UK. The differences are striking particularly considering the range of disability benefits available in the UK. In the UK, at the time the survey was conducted in 2009/10, disabled working-aged adults could receive a Disability Living Allowance (i.e. non means tested, tax free income-transfer disability benefits) and Employment and Support Allowance (i.e. financial and personalized support benefits for those unable to work or need help finding or maintaining work). These benefits were counted in household incomes and analyzed in the study. Our findings indicate that disability benefits at the time the Life Opportunities Survey was fielded were not sufficient to reduce economic hardship and employment opportunities of people with hearing impairment in the UK.

However, the current situation of individuals with hearing impairments is likely to worsen. This is the case because the UK government introduced new cuts to disability benefits after the Life Opportunities Survey was conducted. Disability benefits cuts are likely to exacerbate the economic hardship of people with hearing impairments. In October 2015, the UK government cut the Department for Work and Pensions’ Access to Work scheme, including the closure of REMPLOY factories - state funded sheltered employment for disabled people - between 2012 and 2013 (Department for Work and Pensions, 2016). Under the new system, Work and Pension grants are capped at a yearly maximum of £40,800 for all new claimants and from April 2018 for all pre-October 2015 claimants. In March 2016, Chancellor Osborne announced plans to cut disability benefit system by £1.3 billion per year, which will affect an estimated 640,000 disabled people, including people with hearing impairments (Her Majesty’s Treasury, 2016). Planned cuts include not only direct income transfer but also sign language interpretation and/ vocational training services.
Our results indicate that people with hearing impairment were significantly less likely to be employed than people without hearing impairment even after adjusting for other covariates. A survey by the Royal National Institute for Deaf People (2006) explored barriers to, and experiences of, employment among deaf and hard of hearing people, and found that deafness or hearing loss was a significant barrier to finding work. Almost three quarters of respondents believed that their hearing impairment made it harder to find a job. Specifically, respondents reported that the attitude of employers toward deafness and hearing loss was the single largest barrier, followed by the lack of communication support and lack of suitable jobs. Without disability benefit support and cuts to sign language services and vocational training, more people with hearing impairment are likely to experience barriers at work. According to Kaye and colleagues (2012), 65% of working disabled respondents reported that without the disability benefits they would not be able to work; 30% of respondents indicated their carers would not be able to work without the benefits. As a result, cuts to disability benefits are likely to result in more unemployed deaf or hard of hearing people, who are already underemployed than the general population. Without work, more deaf or hard of hearing people are likely to fall further into poverty. Cuts to disability benefits are likely to result in more unemployed disabled people, and with no income they are more likely to fall into poverty, which will also result in significant long-term financial costs to the government.

Several policy recommendations emanate from these findings. First, more attention should be paid to the economic hardship and challenges of deaf or hard of hearing people. Our findings underscore that deaf or hard of hearing people are significantly more likely to be unemployed, have lower household income, experience difficulties making ends meet, and less likely to afford even £500 of unexpected expense than those who can hear. Therefore, the UK government should increase efforts to ensure financial well-being and employment
opportunities for deaf and hard of hearing people. Employment and Support Allowance should be revised to sufficiently meet deaf or hard of hearing people’s needs, and more incentives and laws should be regulated to increase employers to employ deaf people and accommodate carers. Further, targeted employment experience programmes, peer support, improved education and awareness, Human Resource development programmes with employers, and improved access to legal challenges should be implemented. In addition, diverse communication methods including both sign and spoken should be provided to help deaf and hard of hearing people to actively engage in socioeconomic activities and become financially stable and independent. One of the main needs of deaf and hard of hearing people is access to information and services (Skellington Orr et al., 2006). However, there is shortage of service delivery and information in sign languages and communicative technologies available in the UK (Hunt el al., 2010; British Deaf Association, 2014). According to a survey by the Royal National Institute for Deaf People (2006), the second largest barrier to finding work was due lack of communication support. Hence, more investments on sign interpretation and hearing aids, as well as, direct income support should be considered to increase access and engagement of deaf or hard of hearing people in social and economic participations. Lastly, disability benefits should be extended not curtailed to efficiently reduce the economic hardship of deaf people. Recent UK policymakers’ proposals to cut disability benefits contravenes our research findings. Cutting disability benefits will likely exacerbate the economic hardship experienced by deaf and hard of hearing people and will also result in significant long-term financial costs to the government.

Conclusion

This study analysed data from the nationally representative 2009/10 Life Opportunities Survey to investigate the economic well-being of deaf and hard hearing people in the UK. Deafness or hearing loss is the second largest disability in the UK, yet, to date
there are no population-based studies about hearing impairment and economic well-being. The present study addresses this gap, and is the first to empirically examine the economic well-being of deaf and hard of hearing people in the UK. Findings indicate that people with hearing impairment experienced significantly greater economic hardship than people without hearing impairment. The findings were robust and persisted even after accounting for other demographic characteristics. Efforts to address the economic hardship of deaf and hard of hearing people are needed.
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<td>Household size</td>
<td>3.1</td>
<td>2.7</td>
</tr>
<tr>
<td>Has a dependent child(ren)</td>
<td>39.4%</td>
<td>24.7%</td>
</tr>
<tr>
<td>Education *</td>
<td>3.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Note: All values are un-weighted. *Education is measured as a 6 level ordered categorical variable, where “1” is the highest (“degree level qualification”) and “6” is the lowest (“no formal qualification”). See Table 1 for information of measurement.

***$p < .001$
Table 2. Propensity Score Analyses: Average treatment effect on the treated (ATET) of Hearing Impairment on Economic Well-being

<table>
<thead>
<tr>
<th>Economic Well-being Outcomes</th>
<th>B</th>
<th>Robust SE B</th>
<th>95% C.I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial loan payment</td>
<td>0.04</td>
<td>0.03</td>
<td>−0.02 ~ 0.09</td>
</tr>
<tr>
<td>Severity of financial loan payment</td>
<td>0.05</td>
<td>0.04</td>
<td>−0.02 ~ 0.12</td>
</tr>
<tr>
<td>Difficulties of making ends meet</td>
<td>0.14***</td>
<td>0.03</td>
<td>0.08 ~ 0.20</td>
</tr>
<tr>
<td>Afford to pay for unexpected but necessary expense of £500</td>
<td>−0.15***</td>
<td>0.03</td>
<td>−0.20 ~ −0.09</td>
</tr>
<tr>
<td>Employed</td>
<td>−0.18***</td>
<td>0.03</td>
<td>−0.24 ~ −0.13</td>
</tr>
<tr>
<td>Full-time work</td>
<td>−0.05</td>
<td>0.03</td>
<td>−0.11 ~ −0.02</td>
</tr>
<tr>
<td>Weekly household income (Before Tax)</td>
<td>−105.07***</td>
<td>29.29</td>
<td>−162.48 ~ −47.65</td>
</tr>
</tbody>
</table>

*p < .05 ** p < .01 ***p < .001