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Article

The association between non-standard employment, job insecurity and health among British adults with and without intellectual impairments: Cohort study

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ABSTRACT

We sought to investigate the association between employment conditions and health among working age British adults with and without intellectual impairments. Using data from the 1970 British Cohort Study, we undertook a series of cross sectional analyses of the association between employment conditions and health (self-reported general health, mental health) among British adults with and without intellectual impairments at ages 30, 34 and 42. Our results indicated that: (1) British adults with intellectual impairments were more likely than their peers to be exposed to non-standard employment conditions and experience job insecurity; (2) in both groups exposure was typically associated with poorer health; (3) British adults with intellectual impairments in non-standard employment conditions were more likely than their peers to transition to economic inactivity; (4) among both groups, transitioning into employment was associated with positive health status and transitioning out of employment was associated with poorer health status. British adults with intellectual impairments are significantly more likely than their peers to be exposed to non-standard and more precarious working conditions. The association between employment conditions and health was similar for British adults with and without intellectual impairments. As such, the study found no evidence to suggest that research on causal pathways between employment and health derived from studies of the general population should not generalize to the population of people with intellectual impairments.

1. Introduction

There exists a well-established link between employment status and health, with unemployment being associated with poorer health (Avendano & Berkman, 2014; Bambra & Eikemo, 2009; Bartley, Ferrie, & Montgomery, 2006; Dooley, Fielding, & Levi, 1996). This association appears to be accounted for by two distinct processes; health selection (healthier people are more likely to gain and retain employment), and specific health benefits associated with employment (Avendano & Berkman, 2014; Bartley, 1994; Bartley et al., 2006; van der Noordt, Jzelenberg, Droomers, & Proper, 2014; van Rijn, Robroek, Brouwer, & Burdorf, 2014). The latter is considered of sufficient importance that ensuring equality of access to non-exploitative employment is commonly considered a key policy option for reducing health inequities (World Health Organization, 2008; World Health Organization Regional Office for Europe, 2014).

It is also clear, however, that some forms of employment are more likely to be conducive to promoting health and wellbeing than others. Most obviously poor working conditions (e.g., those associated with high rates of exposure to material hazards and/or excessive job demands) may be detrimental to health (Berkman, Kawachi, & Theorell, 2014). More recently, attention has also begun to focus on the association between exposure to 'non-standard' and 'precarious' employment conditions and health (Benach et al. 2014; Quinlan, Mayhew, & Bohle, 2001). The International Labour Organization defines non-standard employment (NSE) as comprising of four different employment arrangements that deviate from the 'standard employment relationship', understood as work that is full time, indefinite, as well as part of a subordinate relationship between an employee and an employer. These four conditions are temporary employment, part-time or on call work, multi-party employment relationships (e.g., sub-contracted labour) and disguised employment or dependent self-

Abbreviations: AORs, Adjusted odds ratios; BCS70, 1970 British Cohort Study; EI, Economic inactivity; NSE, Non standard employment; SE, Standard employment

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employment (International Labour Organization, 2016). While NSE has become more common, and is expected to continue to proliferate, there is marked variation between countries in the extent to which NSE has become normative (International Labour Organization, 2016).

Although there is no one agreed definition of precarious employment, it is generally considered to be employment that is insecure and where the employee's power and ability to negotiate work conditions is limited (Benach et al., 2014). While precariousness is higher among workers in NSE (International Labour Organization, 2016), it is not exclusively associated with NSE. NSE and/or precarious employment has been associated with a range of indicators of negative health outcomes including: workplace injuries, disability claims, sick leave, poor knowledge of workplace safety measures, and self-reported mental and physical health status (Benach et al., 2014; Bohle, Quinlan, & Mayhew, 2001; International Labour Organization, 2016; Quinlan et al., 2001). However, there is also evidence to suggest that NSE may provide an effective pathway into standard employment for people who are economically inactive (International Labour Organization, 2016).

Policies that seek to reduce health inequity need to take account of the specific situation of groups who are either more likely to be exposed to established social determinants of poor health or who may be particularly vulnerable to the effects of exposure (World Health Organization, 2011; World Health Organization Regional Office for Europe, 2014). People with disabilities are one such group (Emerson et al., 2011). While it is clear that people with disabilities have significantly reduced access to employment (Australian Bureau of Statistics, 2015; Roulstone, 2012; World Health Organization and the World Bank, 2011), very little is known about the employment conditions of people with disabilities who are employed and the association between employment conditions and health for people with disabilities. The available evidence suggests that: (1) in the U.S. people with disabilities were twice as likely to be in NSE than non-disabled Americans (Schur, 2002a, 2002b); (2) if in NSE, disabled Americans are less likely than non-disabled Americans in NSE to receive employer sponsored benefits, more likely to be low paid, more likely to transition to economic inactivity and less likely to transition to standard employment (Schur, 2002a); (3) in Australia employed people with disabilities (especially those with self-reported intellectual impairments) are more likely to experience job insecurity and other employment adversities than non-disabled employees (LaMontagne, Krnjacki, Milner, Butterworth, & Kavanagh, 2016; Milner, Aitken et al. 2015; Milner, Krnjacki, Butterworth, Kavanagh, & LaMontagne, 2015); and (4) the strength of association between employment adversities and poor mental health is similar for employees with and without disabilities (Milner, Krnjacki et al., 2015).

Disability is associated with a wide range of health conditions or impairments and increasing evidence suggests that some impairments are associated with greater levels of disadvantage. For example, people with disabilities with intellectual impairments have much lower rates of employment than people with disabilities generally (Australian Bureau of Statistics, 2015; Berthoud, 2006; Public Health England, 2016).

In this paper we investigate the association between non-standard and precarious employment conditions and health among two groups of people with intellectual impairments; people with intellectual disability and people with borderline intellectual functioning. Intellectual disability refers to a significant general impairment in intellectual functioning that is acquired during childhood. It is commonly defined as scoring more than two standard deviations below the population mean on tests of general intelligence (IQ < 70). While estimates of the prevalence of intellectual disability vary widely (Maulik, Mascarenhas, Mathers, Dua, & Saxena, 2011), it has been estimated that approximately 2% of the adult population of England have an intellectual disability (Public Health England, 2016). Borderline intellectual functioning is most commonly defined as scoring between one and two standard deviations below the population mean on tests of general intelligence (IQ 70–84), with an estimated prevalence of 12–15% of the adult population (Peltopuro, Ahonen, Kaartinen, Seppala, & Narhi, 2014; Salvador-Carulla et al. 2013). It is well established that adults with intellectual impairments have significantly poorer health than their peers and that this difference is, to an extent, related to exposure to more adverse living conditions (Emerson & Hatton, 2014). However, very few population-based studies have examined the employment conditions of people with intellectual impairments who are employed and the association between employment conditions and health among people with intellectual impairments. This omission is particularly stark for people with borderline intellectual functioning (Peltopuro et al., 2014). Evidence does suggest, however, that adults with intellectual disability in employment have better self-rated general health than economically inactive adults with intellectual disability (Emerson & Hatton, 2008; Emerson, Hatton, Robertson, & Baines, 2014).

Given the dearth of existing studies in this area, the aims of the present paper are: (1) to describe the conditions under which people with intellectual impairments were employed; (2) to determine whether the association between non-standard or precarious employment conditions and health is similar for adults with and adults without intellectual impairment; and (3) to describe transitions between employment conditions over time for people with and without intellectual impairments.

2. Methods

We undertook secondary analysis of data from eight waves of the 1970 British Cohort Study (BCS70). Details of BCS70 are available in two cohort profiles (Brown, 2014; Elliott & Shepherd, 2006) and in an extensive series of technical reports and supporting documentation (e.g., interview questionnaires) that are available for download from the UK Data Service (https://www.ukdataservice.ac.uk/). Key methodological aspects of the study are briefly summarised below.

BCS70 is following up over 17,000 children born during one week in the UK in 1970. In the first wave of data collection (soon after birth) information was collected from midwives on 17,198 infants (the cohort members). Since then, information has been collected on various aspects of the lives of cohort members at irregular intervals (age 5 n = 12,939, age 10 n = 14,350, age 16 n = 11,206, age 26 n = 8654, age 30 n = 10,833, age 34 n = 9316, age 38 n = 8874 and age 42 n = 9717) (Hacker et al. 2010; Ketende, McDonald, & Dex, 2010; TNS BMRB, undated). The surveys cover a wide range of issues such as: health; health behaviours; wellbeing; educational attainment; employment and occupation; financial status; social and civic participation; social support; family formation and crime. Data collection in adulthood has been by postal survey (age 26) and computer aided interviews with study members (ages 30, 34, 38, and 42). At age 38 the interview was conducted via telephone. At all other ages the interviews were conducted face-to-face. BCS70 is currently managed by the Centre for Longitudinal Studies at University College London (http://www.cls.ioe.ac.uk/) and is funded by the UK's Economic and Social Research Council (http://www.esrc.ac.uk/). Confidentialised data from the age 5, 10, 16, 26, 30, 34, 38 and 42 follow-up surveys were downloaded from the UK Data Service (Butler & Bynner, 2016, 2017; Butler, Dowling, & Osborn, 2016; Bynner, 2016; Centre for Longitudinal Studies, 2016a, 2016b, 2016c, 2016d).

2.1. Identifying participants with intellectual impairments

While BCS70 included direct measurements of child cognitive functioning at ages 5, 10 and 16 (Parsons, 2014), at no age were complete validated tests of IQ administered. Instead, a range of brief tests were administered, some drawn from validated tests of IQ, others assessing attainment that is likely to be related to IQ. In similar circumstances a number of previous studies have used factor analytic procedures to establish the presence of a general cognitive ability factor across tests (traditionally named '*g*') and, if present and accounting for

an acceptable proportion of common variance, have used standardised scores on the first extracted component (*g*) as a proxy for IQ (Emerson et al. 2014; Parsons, 2014; Schoon, Sacker, Hope, Collishaw, & Maughan, 2005; Totsika, Hastings, Vagenas, & Emerson, 2014).

We followed this practice by deriving a proxy measure of IQ from the results of age 10 cognitive testing and, if these were not available, age 5 cognitive testing. This decision was based on three considerations: (1) cognitive testing at age 10 included four subscales of a well validated test of IQ, the British Ability Scale (Elliott, Murray, & Pearson, 1978; Elliott, Smith, & McCulloch, 1997); (2) the cognitive tests administered at age 10 had greater internal consistency than those administered at age 5 (alpha = 0.89 vs 0.58); and (3) cognitive test results at age 10 were available for a significantly greater percentage of children than at age 16 (87% vs 52%).

At age 10, eight tests were administered: the Shortened Edinburgh Reading Test (Godfrey Thompson Unit, 1978); the Friendly Maths Test (Parsons, 2014); the Pictorial Language Comprehension Test (Parsons, 2014); the Spelling Dictation task (Parsons, 2014); and four subscales of the British Ability Scales, Word Definitions, Word Similarities, Recall of Digits and Matrices (Elliott et al., 1978). In total, 12,885 (87%) of all children participating in the age 10 survey completed at least one assessment and 11,134 (75%) children completed all eight assessments (Parsons, 2014). In order to maximise use of participants' data and to reduce potential bias resulting from exclusion of partial non-respondents (those who completed at least one, but not all tests), missing data for partial respondents were imputed using multiple imputation routines in IBM SPSS 22. Five parallel data sets were imputed for each partial non-respondent and then averaged to create the final imputed data. Principal components analysis was used to establish the presence of a general cognitive ability factor across tests and standardised scores on the first component were extracted as a proxy indicator for IQ (Emerson et al., 2014; Parsons, 2014; Schoon et al., 2005; Totsika et al., 2014). At age 10, the first extracted component accounted for 59% of the variance of initial eigenvalues with all tests loading positively on the component (loading range 0.55 for BAS Digit Recall to 0.88 for the Shortened Edinburgh Reading Test).

Age 5 cognitive test results were available for an additional 2568 children for who no age 10 cognitive test data were available. At age five, five tests were administered: the Copying Designs Test (Rutter, Tizard, & Whitmore, 1970); the English Picture Vocabulary Test (Brimer & Dunn, 1962); the Human Figure Drawing (Draw-a-Person) Test (Harris, 1963); the Complete a Profile Test (Kalverboer, 1972); and the Schonell Reading Test (Schonell, 1971). In total, 13,059 (99%) of all children participating in the age 5 survey completed at least one assessment, with 11,254 (86%) children completing all five assessments (Parsons, 2014). We followed the procedures outlined above to: (1) impute partially missing cognitive test results; (2) establish the presence of a general cognitive ability factor across tests (*g*); (3) use standardised scores on *g* as an indicator of IQ at age 5. At age 5, the first extracted component accounted for 41% of the variance of initial eigenvalues with all tests loading positively on the component (loading range 0.47–0.76).

This procedure generated a proxy measure of IQ for 15,453 participants. Of these, 426 (2.8%) were functioning in the IQ range associated with intellectual disability (IQ 70 or below), 2108 (13.6%) were functioning in the borderline intellectual functioning range (IQ range 71–85) and 12,919 (83.6%) were functioning in a higher IQ range (IQ 86+).

2.2. Employment status and conditions

2.2.1. Standard and non-standard employment

A derived measure summarising the current economic activity of cohort members is included in the published dataset. The 12-category classification of economic activity, based on that used by the UK's Office for National Statistics, includes: full-time employment (working 30+ hours per week); part-time employment (working less than 30 hours per week); full-time self-employment; part-time self-employment; and eight categories of economic inactivity (EI). The data set at ages 30, 34 and 42 also included a variable indicating whether the cohort members' employment contract was permanent or temporary. We defined standard employment (SE) as full-time employment on a permanent contract. We defined non-standard employment (NSE) as full-time employment on a temporary contract or any form of part-time employment (other than self-employment).

2.2.2. Job insecurity

The data set at ages 30, 34 and 42 included one question about job security. At ages 30 and 34 cohort members were asked; '*Would you say your current job is … very secure, fairly secure, or not very secure?*' At age 42 cohort members were asked; '*I would like you to think about your employment prospects over the next 12 months. How likely do you think it is that you will lose your [main] job by being sacked, laid-off, or not having your contract renewed during the next 12 months?*' Response options (on a showcard) were; *1. Very likely, 2. Fairly likely, 3. Fairly unlikely, 4. Very unlikely*. These questions were not asked of cohort members who were self-employed.

2.3. Health indicators

2.3.1. Self-reported general health

A single-item measure of self-reported general health was collected at each adult wave. However, question formats and response options varied across waves. At age 30 cohort members were asked '*How would you describe your health generally? Would you say it is.*' with four response options ('*excellent/good/ fair/ poor*'). At age 34 cohort members were asked '*Please think back over the last 12 months about how your health has been. Compared to people of your own age, would you say that your health has on the whole been.*' followed by five response options ('*excellent/ good/ fair/ poor/very poor*'). At age 42 cohort members were asked '*In general, would you say your health is…*' followed by five response options ('*excellent/very good/good/ fair/ poor*'). Given the variation in questions and response options over time we derived a simple binary measure of health (excellent/very good/good vs. fair/poor/very poor). There is extensive evidence that self-rated health is an important indicator of quality of life,(Alonso et al. 2004) and a robust predictor of mortality in general populations (DeSalvo, Bloser, Reynolds, He, & Muntner, 2006; Idler & Benyamini, 1997; Idler & Benyamini, 1999; Jylha, 2009).

2.3.2. Mental health

At age 30 the 24-item *Malaise Inventory* was used to measure levels of psychological distress or depression (Rutter et al., 1970). Developed from the Cornell Medical Index, the Malaise Inventory has been shown to be fairly robust measure of general mental health with good psychometric qualities including acceptable receiver operating characteristics (area under the curve 0.73–0.87) for predicting current or recent psychiatric morbidity and service use in population samples (Rodgers, Pickles, Power, Collishaw, & Maughan, 1999). The potential presence of a mental health problem was identified by a score or eight or more (Rodgers et al., 1999). The 24-item Malaise Inventory showed good internal consistency in the analytic subsample for cohort members with (alpha = 0.85) and without (alpha = 0.80) intellectual impairments. At ages 34 and 42 an abbreviated 9-item version of the *Malaise Inventory* was used, with potential mental health problem being identified by a score or four or more. The 9-item Malaise Inventory also showed good internal consistency in the analytic subsample for cohort members with (alpha = 0.80) and without (alpha = 0.77) intellectual impairments.

2.3.3. Association between health indicators

The two health indicators were moderately inter-correlated at each age (age 30 $r = 0.23$, $p < 0.001$; age 34 $r = 0.26$, $p < 0.001$; age 42 $r = 0.26$, $p < 0.001$).

Table 1
Non-participation rates in BCS70 from age 5.

	Age 10	Age 16	Age 26	Age 30	Age 34	Age 38	Age 42
ID (n = 426)	7.0%	38.5%	68.8%	47.2%	61.0%	71.8%	59.6%
BIF (n = 2108)	6.5%	37.0%	59.9%	41.4%	53.8%	61.7%	52.4%
Others (n = 12,919)	6.4%	27.0%	41.8%	29.0%	37.9%	42.0%	37.2%

Note: ID = intellectual disability, BIF = borderline intellectual functioning.

2.4. Approach to analysis

Initial exploratory analyses indicated significantly higher attrition rates among cohort members with intellectual impairments when compared to cohort members without intellectual impairments (Table 1). We addressed the issue of bias due to attrition by imputing all missing data (arising from either wave or item non-response) as previous analyses of BCS70 had indicated that well specified imputation models were preferable to the use of sample weights (Mostafa & Wiggins, 2014). Imputation was undertaken using the multiple imputation routines in SPSS 22 to create five parallel data sets. Predictor variables for the imputation models were selected on the basis of known association with attrition and data availability (Groves, 2006; Groves & Couper, 1998). The final variables included were: cohort member gender and ethnicity; intellectual impairment status (see above); health indicators at all ages (see above); indicators of family socio-economic position and child health at ages 5, 10 and 16; self-assessed financial position, economic activity, social class and de facto marital status at ages 26, 30, 34, 38 and 42; disability, basic skill problems and obesity at ages 26, 29, 34 and 42; educational attainment at ages 26, 29, 34 and 38; sense of control at ages 26, 34 and 42; life satisfaction at ages 29, 34 and 42; housing tenure at ages 29, 34 and 38; emotional support at ages 29 and 34; and evidence of hearing or vision problems or epilepsy at any age. All results reported below were based on analysis of pooled data that, to ensure the accuracy of standard errors, had been re-weighted to reflect the original sample size.

Initial exploratory analysis also indicated that intellectual impairments were more common among males (intellectual disability 3.0% vs. 2.5%; borderline intellectual functioning 14.3% vs. 12.9%) and minority ethnic groups (intellectual disability 8.2% vs. 2.4%; borderline intellectual functioning 26.0% vs. 12.9%). Given these between group differences on participant characteristics that are potentially related to health and are typically considered to be set or fixed personal characteristics, all analyses (unless specified) were adjusted to take account of the potential confounding impact of gender and ethnicity. We did not adjust for other potentially 'confounding' contextual characteristics (e.g., educational attainment, childhood poverty, area of residence) as our aims were to describe any differences in the employment conditions (and the association between employment conditions and health) between population groups (people with and without intellectual impairment) that could potentially be amenable to change through social policy interventions. The distribution of groups, exposures and outcomes across these two covariates is presented in Table 2.

In the first stage of analysis we describe the exposure of cohort members with and without intellectual impairments to different employment conditions at ages 30, 34 and 42. We then used binary logistic regression to estimate risk of exposure to NSE among cohort members with intellectual impairments.

In the second stage of analysis we used binary logistic regression to estimate the cross-sectional association between exposure to different employment conditions and health outcomes at age 30, 34 and 42. These analyses were conducted separately for the three groups of participants (those with intellectual disability, those with borderline intellectual functioning and other participants).

In the final stage of the analysis we determined the crude transitional probabilities between Time 1 and Time 2 employment status (SE, NSE, self-employed, and EI) separately for the three groups of cohort members. Transitional probabilities were calculated for ages 30 (T1) and 34 (T2), and fo ages 34 (T1) to 42 (T2). We then used binary logistic regression to estimate risk of poor health among key transition groups (EI to SE, EI to NSE, NSE to SE, and NSE to EI) for cohort members with and without intellectual impairment. Given the small number of participants in the transition groups, the intellectual disability and borderline intellectual functioning groups were combined for this final step in analysis.

Table 2
Distribution of study groups, exposures and outcomes by covariates of sex and ethnicity.

	Sex		Ethnicity	
	Male	Female	White British	Other ethnic group
ID	3.0%	2.5%	2.4%	8.4%
BIF	14.3%	12.9%	13.0%	25.8%
Others	82.7%	84.6%	84.6%	65.8%
Age 30				
SE	52.2%	36.8%	45.4%	34.9%
NSE	7.4%	21.1%	14.1%	12.7%
Self-Employed	10.9%	5.9%	8.3%	11.8%
EI	29.5%	36.2%	32.3%	40.6%
Fair/poor health	27.2%	23.1%	24.8%	32.6%
High Malaise score	21.6%	22.7%	21.7%	29.8%
Age 34				
SE	45.8%	28.7%	38.0%	30.4%
NSE	7.6%	24.8%	16.0%	13.9%
Self-Employed	11.8%	7.0%	9.4%	10.2%
EI	34.8%	39.5%	36.6%	45.5%
Fair/poor health	46.7%	44.2%	44.9%	57.2%
High Malaise score	20.8%	24.2%	22.3%	26.4%
Age 42				
SE	40.3%	26.3%	34.0%	25.9%
NSE	6.1%	25.4%	15.6%	13.1%
Self-Employed	13.9%	8.5%	11.2%	13.4%
EI	39.7%	39.8%	39.3%	47.6%
Fair/poor health	26.5%	24.2%	25.1%	31.1%
High Malaise score	27.5%	30.6%	28.8%	32.2%

3. Results

At all ages there were significant and moderately strong associations between NSE and job insecurity. For example, at age 42 job insecurity was 14.4% among cohort members in NSE compared to 6.6% among those in SE (unadjusted OR = 2.37 (2.02–2.77), $p < 0.001$).

Unadjusted percentage exposure to employment conditions and risk (adjusted odds ratios; AORs) of exposure are presented in Table 3. At all three ages cohort members with intellectual disability or borderline intellectual functioning were more likely to be exposed to NSE and job insecurity than other cohort members, the strength of this association was consistently greater for NSE than job insecurity. Similar patterns were evident in the non-imputed data for NSE. For job insecurity there were no significant or consistent differences between the three groups.

AORs estimating the association between employment conditions and health at each age and for each of the two health indicators are presented separately for the three groups of participants in Table 4. At all three ages and for both health indicators, cohort members in all three groups were more likely to have poorer health status if exposed to NSE or job insecurity. There was no systematic difference in effect sizes between the three groups of cohort members. In the non-imputed data exposure to NSE or job insecurity was associated with poorer health for 17 of the 24 (71%) of the comparisons. Of the seven instances when this pattern was not observed, four were among participants with BIF and three among participants with no intellectual impairment.

Transitional probabilities between NSE and EI at time 1 and

Table 3
Unadjusted percentage exposed and adjusted risk of exposure to non-standard employment conditions and job insecurity among adults with and without intellectual impairments.

	Age 30			Age 34			Age 42		
	% Exposed	AOR	95% CI	% Exposed	AOR	95% CI	% Exposed	AOR	95% CI
Non-standard employment									
ID (n = 426)	35.3%	2.29***	(1.60–3.26)	36.1%	1.62*	(1.12–2.36)	50.8%	2.94***	(1.97–4.39)
BIF (n = 2108)	29.3%	1.55***	(1.33–1.81)	35.3%	1.49***	(1.27–1.75)	38.3%	1.59***	(1.34–1.88)
Others (n = 12,919)	22.9%	1 (ref)		29.0%		1 (ref)	30.3%	1 (ref)	
Job insecurity									
ID	9.0%	1.09	(0.63–1.90)	11.1%	1.41	(0.82–2.41)	13.8%	1.58	(0.93–2.69)
BIF	8.8%	1.08	(0.85–1.36)	11.7%	1.58***	(1.26–1.97)	13.1%	1.57***	(1.26–1.97)
Others	8.0%	1 (ref)		7.6%	1 (ref)		8.5%	1 (ref)	

AOR = adjusted odds ratio, CI = confidence interval, ID = intellectual disability, BIF = borderline intellectual functioning.
Sample sizes for job insecurity analyses were identical to NSE analyses.
* $p < 0.05$.
*** $p < 0.001$.

employment status at time 2 (standard, non-standard, self-employed, economically inactive) for the three groups of cohort members are presented in Table 5. When economically inactive at time 1, the most likely outcome for all three groups was to be economically inactive at time 2. However, the probabilities of remaining economically inactive were significantly greater for cohort members with intellectual disability (age 30/34 z = 3.33, $p < 0.001$; age 34/42 z = 4.05, $p < 0.001$) or borderline intellectual functioning (age 30/34 z = 4.50, $p < 0.001$; age 34/42 z = 4.73, $p < 0.001$) when compared with other cohort members. There were no significant between group differences in the probabilities of transitioning from economic inactivity to NSE. Similar patterns were evident in the non-imputed data.

When in NSE at time 1, the most likely outcome for cohort members with intellectual disability and borderline intellectual functioning was to be economically inactive at time 2. The most likely outcome for other cohort members was to be in NSE. Again, the probabilities of being economically inactive at time 2 were significantly greater for cohort members with intellectual disability (age 30/34 z = 3.27, $p < 0.001$; age 34/42 z = 43.40 $p < 0.001$) or borderline intellectual functioning (age 30/34 z = 4.70, $p < 0.001$; age 34/42 z = 3.88, $p < 0.001$) when compared with other cohort members. While the probability of transitioning from NSE to standard employment decreased as severity of intellectual impairment increased, the between group differences were not statistically significant. Similar patterns were evident in the non-imputed data.

Results of our analyses on the association between transitioning out of EI and NSE and health are presented in Table 6. In general, those who transitioned out of EI to either NSE or SE had significantly better general and mental health than those who remained economically inactive. The strength of this association was generally weaker for participants with intellectual impairments and for those transitioning into NSE (when compared to SE). However, the latter effect was more commonly seen among other participants rather than participants with intellectual impairments. In all analyses transitioning from NSE to EI was associated with significantly poorer health (when compared to remaining in NSE), while there were no significant differences in health status between those transitioning from NSE to SE (when compared to remaining in NSE). The strength of these associations was similar for adults with and without intellectual impairments. Similar patterns were evident in the non-imputed data.

4. Discussion

We compared the association between employment conditions and health between British adults with and without intellectual impairments. Our results indicated that: (1) British adults with intellectual impairments were more likely than their peers to be exposed to non-standard employment conditions and experience job insecurity; (2) in both groups exposure was typically associated with poorer health; (3) British adults with intellectual impairments in non-standard employment conditions were more likely than their peers to transition to economic inactivity; (4) among both groups, transitioning into

Table 4
Adjusted bivariate risk (AOR with 95% CI) of poor health among cohort members exposed to non-standard employment conditions and job insecurity.

	Age 30				Age 34				Age 42			
	'Fair' or 'poor' self-rated health		High malaise score		'Fair' or 'poor' self-rated health		High malaise score		'Fair' or 'poor' self-rated health		High malaise score	
	AOR (n)	95%CI	AOR	95%CI	AOR (n)	95%CI	AOR	95%CI	AOR (n)	95%CI	AOR	95%CI
Non-standard employment (reference category = standard employment)												
ID	3.00** (154)	(1.32–6.83)	2.08	(0.89–4.87)	1.76 (142)	(0.82–3.76)	1.46	(0.65–3.29)	2.65* (120)	(1.04–6.80)	1.07	(0.46–2.49)
BIF	1.46* (989)	(1.05–2.04)	1.76**	(1.24–2.48)	1.88*** (878)	(1.39–2.53)	1.25	(0.87–1.78)	1.47* (789)	(1.01–2.13)	1.78**	(1.25–2.53)
Others	1.94*** (7898)	(1.69–2.24)	1.87***	(1.62–2.17)	2.03*** (7199)	(1.80–2.29)	1.39***	(1.21–1.60)	1.66*** (6611)	(1.40–1.96)	1.37***	(1.19–1.58)
Job insecurity (reference category = secure employment)												
ID	1.01	(0.30–3.44)	1.22	(0.35–4.27)	2.69	(0.82–8.80)	2.00	(0.65–6.15)	2.59	(0.84–8.01)	1.43	(0.47–4.39)
BIF	1.06	(0.64–1.76)	1.15	(0.68–1.95)	1.26	(0.83–1.91)	1.26	(0.77–2.06)	2.12**	(1.35–3.34)	1.94**	(1.25–3.01)
Others	1.67***	(1.39–2.05)	1.69***	(1.37–2.08)	2.07***	(1.74–2.48)	1.54***	(1.24–1.91)	1.82***	(1.45–2.28)	1.91***	(1.57–2.32)

Notes:
AOR = adjusted odds ratio, CI = confidence interval, ID = intellectual disability, BIF = borderline intellectual functioning.
Sample sizes for job insecurity analyses and Malaise analyses are identical to NSE analyses at the same age.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 5
Probability (with 95% CI) of transition from economic inactivity and non-standard employment between ages 30 to 34 and 34 to 42.

	Transition to …							
	SE		NSE		Self-E		EI	
	P	95%CI	P	95%CI	P	95%CI	P	95%CI
Transition from EI								
Ages 30–34								
ID (n = 232)	0.11	(0.05–0.16)	0.12	(0.05–0.18)	0.07	(0.04–0.10)	0.71	(0.65–0.77)
BIF (n = 927)	0.11	(0.09–0.13)	0.14	(0.12–0.16)	0.07	(0.06–0.09)	0.68	(0.65–0.71)
Others (n = 3901)	0.16	(0.15–0.17)	0.16	(0.15–0.18)	0.08	(0.07–0.09)	0.60	(0.57–0.62)
Ages 34–42								
ID (n = 247)	0.06	(0.01–0.12)	0.14	(0.08–0.20)	0.08	(0.04–0.11)	0.72	(0.66–0.77)
BIF (n = 1028)	0.12	(0.10–0.14)	0.14	(0.12–0.16)	0.07	(0.06–0.09)	0.67	(0.64–0.70)
Others (n = 4452)	0.17	(0.16–0.18)	0.15	(0.14–0.16)	0.08	(0.07–0.09)	0.59	(0.57–0.62)
Transition from NSE								
Ages 30–34								
ID (n = 55)	0.16	(0.07–0.26)	0.27	(0.16–0.39)	0.04	(0.00–0.09)	0.53	(0.40–0.66)
BIF (n = 293)	0.18	(0.13–0.22)	0.31	(0.26–0.36)	0.05	(0.03–0.08)	0.46	(0.40–0.51)
Others (n = 1813)	0.23	(0.21–0.25)	0.39	(0.36–0.41)	0.06	(0.05–0.07)	0.32	(0.30–0.34)
Ages 34–42								
ID (n = 53)	0.15	(0.05–0.25)	0.28	(0.16–0.40)	0.04	(0.00–0.09)	0.53	(0.39–0.66)
BIF (n = 314)	0.22	(0.17–0.26)	0.30	(0.25–0.35)	0.06	(0.04–0.09)	0.42	(0.37–0.48)
Others (n = 2096)	0.25	(0.23–0.26)	0.36	(0.34–0.38)	0.08	(0.07–0.09)	0.31	(0.29–0.33)

ID = intellectual disability, BIF = borderline intellectual functioning,
NSE = non-standard employment, SE = standard employment, Self-E = self-employed, EI = economic inactivity,
CI = confidence interval.

employment was associated with positive health status and transitioning out of employment was associated with poorer health status.

These results add to the existing literature on the association between employment conditions and health in three important ways. First, this is the first study, to our knowledge, to examine levels of exposure to non-standard employment conditions and health among adults with intellectual impairments. This is of considerable importance as: (1) exposure to non-standard employment conditions is growing and has been previously associated with poorer health outcomes in the general population (Benach et al., 2014; Bohle et al., 2001; International Labour Organization, 2016; Quinlan et al., 2001); and (2) adults with intellectual impairments, who comprise approximately 15% of the adult population, are known to experience significantly poorer health than their peers (Emerson & Hatton, 2014). Our results suggest that the association between non-standard employment conditions and health is very similar for adults with and without intellectual impairments. As such, there is no evidence to suggest that knowledge derived from studies based on the general population should not generalise to adults with intellectual impairments.

Second, this is also the first study to examine transitions into and out of non-standard employment conditions among adults with intellectual impairments. This is important as: (1) it is known that adults with intellectual impairments are under-represented in the labour force (Australian Bureau of Statistics, 2015; Berthoud, 2006; Public Health England, 2016); and (2) it has been suggested that non-standard employment conditions may provide an effective pathway from economic inactivity into standard employment (International Labour Organization, 2016). However, our results indicate that, while there are no differences between people with and without intellectual impairment with regard to transitioning from economic activity into NSE, there were marked systematic differences with regard to exit transitions. Specifically, the most likely outcome for cohort members with intellectual disability and borderline intellectual functioning was to transition to economic inactivity, while the most likely outcome for other cohort members was to remain in NSE. These results suggest that for only a minority of people may NSE provide an effective pathway from economic inactivity into standard employment and that this may be less likely for adults with intellectual impairments.

Finally, this is also the first study to examine the association between transitions into and out of non-standard employment conditions and health among adults with intellectual impairments. The results (transitioning into employment was associated with positive health status and transitioning out of employment was associated with poorer health status) are consistent with existing research on employment status and health (Avendano & Berkman, 2014; Bambra & Eikemo, 2009; Bartley et al., 2006; Dooley et al., 1996). Again, we found no evidence to suggest that knowledge derived from studies based on the general population should not generalise to adults with intellectual impairments.

The main strength of the study is the use of a sample that was broadly representative of British citizens born in 1970. Four limitations need to be kept in mind when considering the implications of the study. First, it was not possible from the data available to identify two classes of NSE; multi-party employment relationships (e.g., sub-contracted labour) and disguised employment or dependent self-employment (International Labour Organization, 2016). Any biases arising from this failure are likely to have led to an underestimate of the differences in health status between cohort members in SE and NSE as full-time multi-party employment relationships would have been coded as SE.

Second, while the study was longitudinal in nature, the time periods between data collection precluded any analysis of the temporal ordering of changes in employment status and health. As such, it is not possible to draw any conclusions from these data with regard to causal pathways that lead to the observed association between employment conditions and health. As noted previously, existing evidence suggests that this association is likely to reflect the operation of two distinct processes; health selection (healthier people are more likely to gain and retain employment), and specific health benefits associated with employment (Avendano & Berkman, 2014; Bartley, 1994; Bartley et al., 2006; van der Noordt et al., 2014; van Rijn et al., 2014). It is important to note that 'health selection' in relation to people with disabilities is likely to encompass discriminatory biases resulting from the barriers British adults with disabilities face in securing and retaining employment (Equality and Human Rights Commission, 2017; Office for Disability Issues, 2011).

Third, the irregularity in and significant gaps in time between data

Table 6
Associations between employment condition transitions and risk (AOR with 95% CI) of poor health.

	Intellectual impairment[a]				Other			
	Model 1		Model 2		Model 1		Model 2	
	AOR (n)	95%CI	AOR	95%CI	AOR (n)	95%CI	AOR	95%CI
'Fair' or 'poor' self-rated health								
Age 30–34								
Time 1 EI, time 2 …								
EI	1.0 (793)		1.0		1.0 (2325)		1.0	
SE	0.59** (127)	(0.40–0.88)	0.63*	(0.42–0.95)	0.29*** (632)	(0.24–0.34)	0.29***	(0.24–0.35)
NSE	0.61** (154)	(0.42–0.87)	0.62*	(0.43–0.90)	0.45*** (640)	(0.38–0.55)	0.48***	(0.40–0.58)
Time 1 NSE, time 2 …								
NSE	1.0 (106)		1.0		1.0 (702)		1.0	
SE	1.18 (61)	(0.61–2.30)	1.29	(0.66–2.54)	0.95 (419)	(0.72–1.27)	0.95	(0.71–1.28)
EI	3.45*** (163)	(2.01–5.92)	2.49***	(1.43–4.31)	4.17*** (586)	(3.26–5.34)	3.77***	(2.93–4.85)
Age 34–42								
Time 1 EI, time 2 …								
EI	1.0 (863)		1.0		1.0 (2642)		1.0	
SE	0.37*** (143)	(0.25–0.55)	0.38***	(0.25–0.56)	0.22*** (761)	(0.18–0.27)	0.23***	(0.19–0.29)
NSE	0.38*** (175)	(0.27–0.55)	0.41***	(0.28–0.59)	0.29*** (683)	(0.24–0.36)	0.33***	(0.27–0.41)
Time 1 NSE, time 2 …								
NSE	1.0 (109)		1.0		1.0 (757)		1.0	
SE	0.83 (75)	(0.39–1.78)	0.78	(0.36–1.70)	0.83 (516)	(0.58–1.18)	0.77)	(0.54–1.10
EI	3.45*** (160)	(1.92–6.19)	2.75**	(1.50–5.04)	3.91*** (654)	(2.96–5.17)	3.07***	(2.24–3.70)
High Malaise score								
Age 30–34								
Time 1 EI, time 2 …								
EI	1.0		1.0		1.0		1.0	
SE	0.78	(0.51–1.17)	0.79	(0.52–1.20)	0.52***	(0.42–0.64)	0.54***	(0.44–0.68)
NSE	0.74	(0.50–1.08)	0.76	(0.52–1.13)	0.69***	(0.56–0.85)	0.73**	(0.59–0.90)
Time 1 NSE, time 2 …								
NSE	1.0		1.0		1.0		1.0	
SE	1.00	(0.49–2.06)	1.05	(0.50–2.19)	0.92	(0.66–1.29)	0.90	(0.65–1.27)
EI	1.46	(0.84–2.52)	1.40	(0.80–2.46)	2.22***	(1.70–2.91)	1.90***	(1.43–2.51)
Age 34–42								
Time 1 EI, time 2 …								
EI	1.0		1.0		1.0		1.0	
SE	0.40***	(0.27–0.60)	0.41***	(0.28–0.62)	0.39***	(0.33–0.47)	0.40***	(0.33–0.48)
NSE	0.68*	(0.48–0.95)	0.68*	(0.48–0.96)	0.48***	(0.39–0.58)	0.50***	(0.41–0.61)
Time 1 NSE, time 2 …								
NSE	1.0		1.0		1.0		1.0	
SE	0.69	(0.35–1.36)	0.65	(0.32–1.29)	1.04	(0.78–1.39)	1.01	(0.76–1.36)
EI	2.08**	(1.22–3.57)	2.40**	(1.43–4.02)	2.64***	(2.05–3.39)	2.50***	(1.93–3.24)

Notes:
NSE = non-standard employment, SE = standard employment, EI = economic inactivity,
AOR = adjusted odds ratio, CI = confidence interval
Model 1 adjusted for sex and ethnicity; Model 2 adjusted for sex, ethnicity and health status at time 1.
Sample sizes for Model 2 and for high Malaise score are identical to Model 1 self-rated health.
[a] Either intellectual disability or borderline intellectual functioning.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

collection points suggest that the results of the descriptive transition analyses need to be treated with caution. The data do not allow for the identification of onset and offset of specific episodes of employment, nor do they include information on episodes of employment prior to or following points of data collection.

Finally, we used two overlapping indicators of health, one of which (self-reported general health) is clearly not equivalent to health status per se (Sen, 2002). Indeed, the relationship between general self-reported health and morbidity is complex and likely to reflect such factors as individual and group differences in (a) interpreting the question (e.g., the time span over which health is to be evaluated, whether health includes mental health as well as physical health), (b) expectations regarding what would constitute good or poor health, and (c) the extent to which ill health impacts on meeting the demands of everyday life. Thus, for example, evidence suggests that low socioeconomic position may be associated with an underreporting of ill health, an association that would lead to measures of self-reported health underestimating social gradients in health status (Blane, Power, & Bartley, 1996).

Further research is needed to untangle the causal pathways that result in people with intellectual impairments being more likely to be exposed to non-standard and insecure employment. These are likely to include the 'direct' effects of intellectual impairment on reducing the chances of securing standard or secure employment (e.g., general intellectual impairment de facto debars people entering professional occupations that require graduate or post-graduate level educational qualifications). They are also, however, likely to include pathways that are socially mediated and consequently potentially amenable to social policy interventions. For example, people with intellectual impairments are significantly more likely than their peers to grow up in poorer

families and/or more deprived neighbourhoods (Emerson & Hatton, 2014; Peltopuro et al., 2014), conditions that are in themselves likely to impede educational attainment, employment and employment in standard and secure conditions (Duncan, Ziol-Guest, & Kalil, 2010; UNICEF, 2016; World Health Organization Regional Office for Europe, 2014).

Competing interests

The authors have no competing interests to declare.

References

Alonso, J., Ferrer, M., Gandek, B., Ware, J. E., Aaronson, N. K., Mosconi, P., et al. (2004). Health related quality of life associated with chronic conditions in eight countries: Results from the International quality of life assessment (IQOLA) project. *Quality of Life Research, 13*, 283–298.

Australian Bureau of Statistics (2015). *Disability and labour force participation, 2012. Report No.: 4433.0.55.006.* Canberra: Australian Bureau of Statstics.

Avendano, M., & Berkman, L. F. (2014). Labor markets, employment policies, and health. In L. F. Berkman, I. Kawachi, & M. M. Glymour (Eds.). *Social epidemiology* (pp. 182–233). Oxford: Oxford University Press.

Bambra, C., & Eikemo, T. A. (2009). Welfare state regimes, unemployment and health: A comparative study of the relationship between unemployment and self-reported health in 23 European countries. *Journal of Epidemiology and Community Health, 63*, 92–98.

Bartley, M. (1994). Unemployment and ill health-understanding the relationship. *Journal of Epidemiology and Community Health, 48*(4), 333–337.

Bartley, M., Ferrie, J., & Montgomery, S. M. (2006). Health and labour market disadvantage: Unemployment, non-employment, and job insecurity. In M. Marmot, & R. G. Wilkinson (Eds.). *Social Determinants of Health* (pp. 78–96). Oxford: Oxford University Press.

Benach, J., Vives, A., Amable, M., Vanroelen, C., Tarafa, G., & Muntaner, C. (2014). Precarious employment: Understanding an emerging social determinant of health. *Annual Review of Public Health, 35*, 229–253.

Berkman, L. F., Kawachi, I., & Theorell, T. (2014). Working conditions and health. In L. F. Berkman, I. Kawachi, & M. M. Glymour (Eds.). *Social epidemiology* (pp. 153–181). Oxford: Oxford University Press.

Berthoud, R. (2006). *Employment rates of disabled people.* London: Department for Work and Pensions.

Blane, D., Power, C., & Bartley, M. (1996). Illness behaviour and the measurement of class differentials in morbidity. *Journal of Royal Statistical Society Series A (Statistics in Society), 159*(1), 77–92.

Bohle, P., Quinlan, M., & Mayhew, C. (2001). The Health and safety effects of job insecurity: an evaluation of the evidence. *Economic and Labour Relations Review, 12*, 32–60.

Brimer, M.A., & Dunn, L.M. (1962). English Picture Vocabulary Test: Educational Evaluation Enterprises.

Brown, M. (2014). 1970 British cohort study. *Journal of Open Health Data, 2*(1), e6.

Butler, N., & Bynner, J.M. (2016). 1970 British cohort study: ten-year follow-up, 1980. [data collection]. 6th Edition (Publication no. http://doi.org/10.5255/UKDA-SN-3723-7). from UK Data Service. SN: 3723:.

Butler, N., & Bynner, J.M. (2017). 1970 British cohort study: sixteen-year follow-up, 1986. [data collection]. 7th Edition (Publication no. http://doi.org/10.5255/UKDA-SN-3535-4). from UK Data Service. SN: 3535:.

Butler, N., Dowling, S., & Osborn, A. (2016). 1970 British cohort study: five-year follow-up, 1975. [data collection]. 5th Edition (Publication no. http://doi.org/10.5255/UKDA-SN-2699-4). from UK Data Service. SN: 2699:.

Bynner, J.M. (2016). 1970 British cohort study: twenty-six-year follow-up, 1996. [data collection]. 5th Edition (Publication no. http://doi.org/10.5255/UKDA-SN-3833-3). from UK Data Service. SN: 3833:.

Centre for Longitudinal Studies (2016a). 1970 British cohort study: forty-two-year follow-up, 2012. [data collection]. 2nd Edition (Publication no. http://doi.org/10.5255/UKDA-SN-7473-2). from UK Data Service. SN: 7473:.

Centre for Longitudinal Studies (2016b). 1970 British cohort study: thirty-eight-year follow-up, 2008–2009. [data collection]. 4th Edition (Publication no. http://doi.org/10.5255/UKDA-SN-6557-3). from UK Data Service. SN: 6557:.

Centre for Longitudinal Studies (2016c). 1970 British cohort study: thirty-four-year follow-up, 2004–2005. [data collection]. 4th Edition (Publication no. http://doi.org/10.5255/UKDA-SN-5585-3). from UK Data Service. SN: 5585:.

Centre for Longitudinal Studies (2016d). 1970 British cohort study: twenty-nine-year follow-up, 1999–2000. [data collection]. 4th Edition (Publication no. http://doi.org/10.5255/UKDA-SN-5558-3). from UK Data Service. SN: 5558:.

DeSalvo, K. B., Bloser, N., Reynolds, K., He, J., & Muntner, P. (2006). Mortality prediction with a single general self-rated health question: A meta-analysis. *Journal of General Internal Medicine, 21*, 267–275.

Dooley, D., Fielding, J., & Levi, L. (1996). Health and unemployment. *Annual Review of Public Health, 17*, 449–465.

Duncan, G. J., Ziol-Guest, K. M., & Kalil, A. (2010). Early-childhood poverty and adult attainment, behavior, and health. *Child Development, 81*, 306–325.

Elliott, C., Murray, D., & Pearson, L. (1978). *British ability scales.* Windsor: National Foundation for Educational Research.

Elliott, C., Smith, P., & McCulloch, K. (1997). *British ability scales* (2nd ed.). London: nferNelson.

Elliott, J., & Shepherd, P. (2006). Cohort profile: 1970 British birth cohort (BCS70). *International Journal of Epidemiology, 35*, 836–843.

Emerson, E., Blacher, J., Einfeld, S., Hatton, C., Robertson, J., & Stancliffe, R. (2014). Environmental risk factors associated with the persistence of conduct difficulties in children with and without intellectual disabilities or autistic spectrum disorders. *Research in Developmental Disabilities, 35*, 3508–3517.

Emerson, E., & Hatton, C. (2008). Socioeconomic disadvantage, social participation and networks and the self-rated health of English men and women with mild and moderate intellectual disabilities: Cross sectional survey. *European Journal of Public Health, 18*, 31–37.

Emerson, E., & Hatton, C. (2014). *Health inequalities and people with intellectual disabilities.* Cambridge: Cambridge University Press.

Emerson, E., Hatton, C., Robertson, J., & Baines, S. (2014). Perceptions of neighbourhood quality, social and civic participation and the self rated health of British adults with intellectual disability: Cross sectional study. *BMC Public Health, 14*, 1252 (doi:1210.1186/1471-2458-1214-1252).

Emerson, E., Madden, R., Graham, H., Llewellyn, G., Hatton, C., & Robertson, J. (2011). The health of disabled people and the social determinants of health. *Public Health, 125*, 145–147.

Equality and Human Rights Commission (2017). *Being disabled in Britain: A journey less equal.* London: Equality and Human Rights Commission.

Godfrey Thompson Unit (1978). *Edinburgh reading test.* Sevenoaks: Hodder and Stoughton.

Groves, R. M. (2006). Nonresponse rates and nonresponse bias in household surveys. *Public Opinion Quarterly, 70*, 646–675.

Groves, R. M., & Couper, M. P. (1998). *Nonresponse in household interview surveys.* New York: Wiley.

Hacker, E., Gatenby, R., Killpack, C., Bhamra, S., Larkin, C., & Lessof, C. (2010). *Technical report of the 1970 British cohort study: 2008–2009 survey.* London: NatCen.

Harris, D. B. (1963). *Children's drawings as measures of intellectual maturity.* New York: Harcourt, Brace and World.

Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior, 38*, 21–37.

Idler, E. L., & Benyamini, Y. (1999). Community studies reporting association between self-rated health and mortality: Additional studies, 1995 to 1998. *Research on Aging, 21*, 392–401.

International Labour Organization (2016). *Non-standard employment around the world: Understanding challenges, shaping prospects.* Geneva: International Labour Office.

Jylha, M. (2009). What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Social Science & Medicine, 69*, 307–316.

Kalverboer, A. F. (1972). *A Profile test for the spatial-constructive development.* Lisse: Switz & Zeitlinger.

Ketende, S. C., McDonald, J., & Dex, S. (2010). *Non-response in the 1970 British cohort study (BCS70) from birth to 34 years:* London: Centre for Longitudinal Studies, Institute of Education.

LaMontagne, A. D., Krnjacki, L., Milner, A., Butterworth, P., & Kavanagh, A. (2016). Psychosocial job quality in a national sample of working Australians: A comparison of persons working with versus without disability. *SSM Population Health, 2*, 175–181.

Maulik, P. K., Mascarenhas, M. N., Mathers, C. D., Dua, T., & Saxena, S. (2011). Prevalence of intellectual disability: A meta-analysis of population-based studies. *Research in Developmental Disabilities, 32*, 419–436.

Milner, A., Aitken, Z., Krnjacki, L., Bentley, R., Blakely, T., LaMontagne, A. D., et al. (2015). Perceived fairness of pay among people with and without disabilities: A propensity score matched analysis of working Australians. *Scandinavian Journal of Work, Environment and Health, 41*(5), 451–459.

Milner, A., Krnjacki, L., Butterworth, P., Kavanagh, A., & LaMontagne, A. D. (2015). Does disability status modify the association between psychosocial job quality and mental health? A longitudinal fixed-effects analysis. *Social Science and Medicine, 144*, 104–111.

Mostafa, T., & Wiggins, R. D. (2014). *Handling attrition and non-response in the 1970 British cohort study: CLS working paper 2014/2.* London: Centre for Longitudinal Studies.

Office for Disability Issues (2011). *Life opportunities survey: Wave one results, 2009/11.* London: Office for Disability Issues.

Parsons, S. (2014). *Childhood cognition in the 1970 British cohort study.* London: Centre for Longitudinal Studies, UCL.

Peltopuro, M., Ahonen, T., Kaartinen, J., Seppala, H., & Narhi, V. (2014). Borderline intellectual functioning: A systematic literature review. *Intellectual & Developmental Disabilities, 52*, 419–443.

Public Health England (2016). *People with learning disabilities in England 2015: Main report.* London: Public Health England.

Quinlan, M., Mayhew, C., & Bohle, P. (2001). The global expansion of precarious employment, work disorganization, and consequences for occupational health: A review of recent research. *International Journal of Health Services, 31*, 335–414.

Rodgers, B., Pickles, A., Power, C., Collishaw, S., & Maughan, B. (1999). Validity of the malaise inventory in general population samples. *Social Psychiatry and Psychiatric Epidemiology, 34*, 333–341.

Roulstone, A. (2012). Disabled people, work and employment: A global perspective. In N. Watson, C. Thomas, & A. Roulstone (Eds.). *Routledge companion disability studies* (pp. 211–224). London: Routledge.

Rutter, M., Tizard, J., & Whitmore, K. (1970). *Education, health behaviour.* London: Longmans.

Salvador-Carulla, L., García-Gutiérrez, J. C., Gutiérrez-Colosía, M. R., Artigas-Pallarès, J., Ibánez, J. C., Pérez, J. G., et al. (2013). Borderline intellectual functioning: Consensus and good practice guidelines. *Revista Psiquiatria York Salud Mental, 6*, 109–120.

Schonell, F. J. (1971). *Reading and spelling tests.* Edinburgh: Oliver and Boyd.

Schoon, I., Sacker, A., Hope, S., Collishaw, S., & Maughan, B. (2005). Children's development in the family environment. In S. Dex, & H. Joshi (Eds.). *Children of the 21st Century: From birth to nine months* (pp. 159–174). Bristol: Policy Press.

Schur, L. A. (2002a). Dead end jobs or a path to economic well being? The consequences of non-standard work among people with disabilities. *Behavioral Sciences and the Law, 20*, 601–620.

Schur, L. A. (2002b). The difference a job makes: The effects of employment among people with disabilities. *Journal of Economic Issues, 36*, 339–347.

Sen, A. (2002). Health: Perception versus observation. *British Medical Journal, 324*, 860–861.

TNS BMRB (undated). Technical report of the 1970 British Cohort Study: Age 42 survey (2012–2013). London: TNS BMRB.

Totsika, V., Hastings, R. P., Vagenas, D., & Emerson, E. (2014). Parenting and the behaviour problems of young children with an intellectual disability: Concurrent and longitudinal relationships in a population-based study. *American Journal of Intellectual and Developmental Disabilities, 119*, 422–435.

UNICEF (2016). *The state of the world's children 2016: A fair chance for every child.* New York: UNICEF.

van der Noordt, M., Jzelenberg, H. I., Droomers, M., & Proper, K. I. (2014). Health effects of employment: A systematic review of prospective studies. *Occupational and Environmental Medicine, 71*, 730–736.

van Rijn, R. M., Robroek, S. J. W., Brouwer, S., & Burdorf, A. (2014). Influence of poor health on exit from paid employment: A systematic review. *Occupational and Environmental Medicine, 71*, 295–301.

World Health Organization (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health. Final report of the Commission on the Social Determinants of Health.* Geneva: World Health Organization.

World Health Organization (2011). *Rio political declaration on social determinants of health.* Geneva: World Health Organization. http://www.who.int/sdhconference/declaration/en/.

World Health Organization and the World Bank (2011). *World report on disability.* Geneva: World Health Organization.

World Health Organization Regional Office for Europe (2014). *Report on social determinants and the health divide in the WHO European Region: Final report (updated).* Copenhagen: World Health Organization Regional Office for Europe.