Stress, Domination and Basic Income: Considering a citizens' entitlement response to a public health crisis

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Abstract: In 2015/16, stress was found psychologically to be responsible for 37% of work-related illnesses and 45% of working days lost due to illness in Great Britain. Stress has also been linked to long-term chronic health conditions – including heart disease, stroke, cancer, type 2 diabetes, arthritis and depression – responsible for 70% of NHS England spend, 50% of GP appointments, 64% of outpatient appointments and 70% of inpatient bed days. It is apparent that medical responses to stress-related illness contribute to the NHS funding crisis without resolving underlying causes. It is necessary to address the *social* bases of this public *health* issue. We argue that one of the primary causes of stress stems from a basic assumption of modern economics: that hierarchies are essential to organizational success. We argue that the combination of hierarchy and possibility of destitution inflicts domination on individuals. We then consider the potential contribution of Universal Basic Income (UBI) to dealing causally with this public health problem. This marks a new development in both the public health and UBI literatures. We conclude that future trials and studies of UBI ought to measure physiological effects on stress as part of an holistic evaluation of the policy.
Keywords: Stress; domination; Universal Basic Income; public health

Introduction

In 2015/16, stress as a psychological phenomenon was found to be responsible for '37% of all work related ill health cases and 45% of all working days lost due to ill health' in Great Britain (Health and Safety Executive, 2016, p. 2). The effect of stress on health and the attendant burden on public finances is, though, much broader. In 2012, the Department of Health estimated that a quarter of all people in England, some 15 million, suffered from long-term chronic health conditions such as heart disease, stroke, cancer, type 2 diabetes, arthritis and depression (2012, p. 5). The same Department of Health report suggests that caring for patients with long-term conditions accounts for 70% of NHS England spend, representing 50% of all GP appointments, 64% of outpatient appointments and 70% of all inpatient bed days (2012, p. 3). The medical literature strongly suggests that many such long-term conditions are linked to stress as individuals respond first psychologically and then biologically to threatening stimuli (see Cooper & Quick, 2017; Cohen et al., 2012; Schneiderman, Ironson & Siegel, 2005; Dhabhar, 2009; Henderson & Baum, 2004; Everly Jr & Lating, 2013; Thoits, 2010; Cf. Liu, et al., 2016).

Increasingly, it is becoming apparent that medical responses to stress-related ill-health fail adequately to promote health, while actively contributing to the NHS funding crisis. In order to deal effectively with this issue, it is necessary to understand and address the *social* bases of this public *health* issue. In what follows, we argue that one of the primary causes of stress stems from a basic assumption in modern economic thinking: that hierarchies are essential to organizational success (Kastelle, 2013). We draw upon the republican political philosophical tradition and the epidemiological literature to argue that the combination of hierarchy and the possibility of destitution inherent in modern, neo-liberal corporate structures inflicts domination on individuals. We engage with a number of empirical studies, including the Whitehall Study of UK Civil Servants (see Marmot et al., 1978) and the Labour Force Survey (see Office for National Statistics, 2017), to contend that such domination inflicts stress even on those who do not exist in absolute poverty. We examine the medical literature to we outline the way in which stress responses to these experiences lead to illness and disease. This enables us to assert that, in order to address the causes of the present endemic, public health policy ought to be grounded in social and economic policy aimed at minimizing sources of domination.

We consider the potential contribution of one socio-economic policy: Universal Basic Income (UBI). UBI is a system of unconditional cash transfers to citizens that is typically presented as an alternative to need-based welfare systems. UBI is subject to trials in a number of contexts, with the Scottish government considering a proposal to give citizens up to £150 per week (Farrell, 2017). Historically, UBI has been justified as a means of promoting citizens' rights (Pettit, 2007) within a state (see discussion in Ferry, 1995), increasing efficiency in welfare systems (Gordon, 2014) and promoting growth (Sheahan, 2012). The notion of deploying UBI for reasons of public health, and grounding those reasons in the medical literature, marks a key development within the field. At a time in which the UK Government has a long-standing commitment to austerity, we argue that UBI may be an efficient means of dealing causally, rather than symptomatically, with the problem of stress. As such, we conclude that there are good reasons to measure physiologically the effect of UBI on stress, including, and especially, among the employed, in future studies. Broader prospective arguments for and against the costs and benefits, that have been discussed in length elsewhere (see, for example, Martinelli, 2017; OECD, 2017; Standing, 2017), are beyond the scope of this article. We begin by tracing the relationship between social structures, stress and health.

The stress response and health consequences

Homeostasis – the state of near constant biological regulation – is the existential foundation of all living organisms (see Maslow, 1970, pp. 35-36; Chrousos & Gold, 1992, pp. 1245). Stress consists in the perception of, and response to, a threat to homeostasis. Stress represents, therefore, the most fundamental challenge an individual being can experience (see Cannon, 1932). It effects a cascade of biological changes that prime the body to respond to physical and existential harm (see Currie & Symmington, 1955). In normal circumstances, in which a healthy individual faces only occasional threats, this response is considered adaptive (Smith & Vale 2006, p. 383; Schneiderman, Ironson & Siegel, 2005, p. 612; Henderson & Baum, 2004, p. 72). Through a process of nervous and endocrine activation (Chrousos & Gold, 1992, pp. 1245-1246; Hartzell, Dodd, & Gatchel, 2017, p. 211; Henderson & Baum, 2004, p. 72), physiological changes are effected including 'increased cardiovascular tone, respiratory rate, and intermediate metabolism, along with inhibition of general vegetative functions such as feeding, digestion, growth, reproduction' (Smith & Vale, 2006, p. 383; see also Henderson & Baum, 2004, p. 72). Acute stress can also enhance innate and adaptive immune responses to 'prepare the immune system for challenges (e.g. wounding or infection) that may be imposed by a stressor (e.g. predator or surgical procedure)' (Dhabhar, 2009, p. 300).

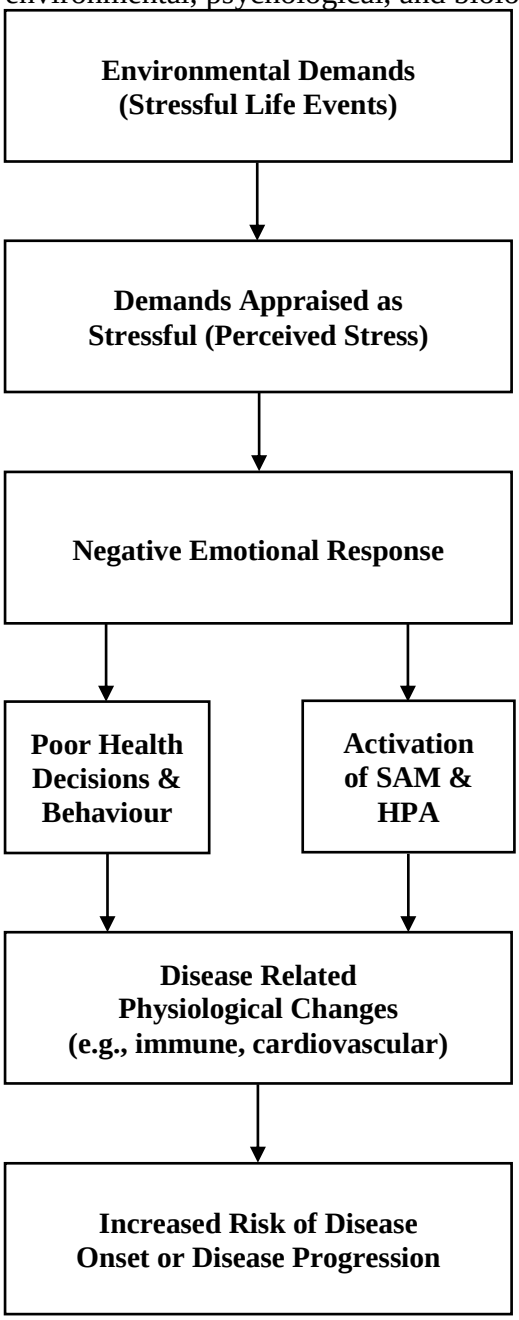
Following appraisal of a stimulus as a threat, there is an initial fast, but short-lived, response from the sympathetic nervous system (SNS) using direct synaptic transmission that increases, among other things, heart and respiratory rate, followed with stimulation of the endocrine system to maintain this response and activate longer-term support mechanisms (Hartzell, Dodd, & Gatchel, 2017, p. 211; Henderson & Baum, 2004, p. 72). Two systems, in particular, drive this secondary response: the sympathoadrenal medullary (SAM) system, which releases catecholamines, including adrenaline (Everly Jr. & Lating, 2013, p. 34; Carrasco & Van de Kar, 2003, p. 237; Schneiderman, Ironson & Siegel 2005, pp. 612-613) to augment and support direct SNS effects (Henderson & Baum, 2004, p. 72); and the hypothalamic pituitary adrenal (HPA) axis that, following a chain of hormonal causation, releases corticosteroids, including cortisol – a glucocorticoid –, which effects metabolism, inflammation (Henderson & Baum, 2004, p. 72; Hartzell, Dodd, & Gatchel, 2017, p. 211) and, crucially, short-term innate immune system activation involving macrophages and natural killer cells to respond to unknown pathogens (Schneiderman, Ironson & Siegel 2005, p. 613; Dhabhar, 2009, p. 300). These effects are usually self-limiting by natural feedback inhibition (Chrousos & Gold, 1992, pp. 1249; Dhabhar, 2009, p. 310). Glucocorticoids, such as cortisol, inhibit corticotropin-releasing hormone (Carrasco & Van de Kar, 2003, p. 237-238; Smith & Vale, 2006, p. 384), which usually acts to cause the secretion of Adrenocorticotropic hormone (ACTH) (Henderson & Baum, 2004, p. 72; Smith & Vale 2006, p. 384). This stimulates the secretion of glucocorticoids, such as cortisol (Smith & Vale 2006, pp. 386-387; Carrasco & Van de Kar, 2003, p. 237; Henderson & Baum, 2004, p. 72). A more direct feedback system exists in the SAM system, with the adrenal medulla sensitive to the effects of adrenaline through 'α2-Adrenoceptors on central and sympathetic axon terminals and on the chromaffin cells' (Fagerholm, Haaparanta & Scheinin 2011, p. 365).

When these feedback systems are disrupted, the effects on health can be deleterious (Dhabhar, 2009, p. 301; Henderson & Baum, 2004, p. 72; Everly Jr & Lating, 2013, pp. 40-43; Schneiderman, Ironson & Siegel 2005, pp. 616-617). Chronic psychological stress is 'associated with a greater risk of depression, cardiovascular disease (CVD), diabetes, autoimmune diseases, upper respiratory infections (URIs), and poorer wound healing' (Cohen et al., 2012, p. 5995; see also Henderson & Baum, 2004, p. 73). It was formerly believed that this association resulted simply and directly from long-term (over)activation of the SAM and HPA systems, especially through excessive secretion of cortisol. Proponents contended that this causes 'allostatic load': 'wear and tear' that undermines the capacity to achieve allostasis – 'the ability to achieve stability through change' (McEwen, 1998, pp. 171-172; see also Cohen, Gianaros and Manuck, 2016, p. 457). It was speculated that this 'allostatic load over a lifetime may cause the allostatic systems to wear out or become exhausted' (McEwen, 1998, p. 173) leading to reduced secretion of, for example, cortisol, responsible for an increase of inflammatory cytokines (p. 173) – proteins released by cells to communicate with each other.

However, recent studies have demonstrated that levels of cortisol are a poor predictor of disease risk (Cohen et al., 2012, p. 5997; see also Edwards et al., 2003). Instead, psychobiological evidence has suggested that the effect of chronic stress and excessive release of cortisol is 'compensatory downregulation of glucocorticoid receptor (GR) expression and functioning' (Miller, et al., 2009, p. 824; see also Cohen et al., 2012, p. 5997). Such 'glucocorticoid resistance' renders anti-inflammatory instructions from glucocorticoids to (immune) cells insufficient (Cohen et al., 2012, p. 5995; Miller, Cohen & Ritchey, 2002, p. 538) and likely impedes function of the hypothalamic-pituitary-adrenal feedback loop (Marques, Silverman & Sternberg, 2009, p. 6; see also Miller, Cohen & Ritchey, 2002, p. 539). This (indirect) process can increase inflammation and autoimmunity, leading to increased risk of disease (Cohen et al., 2012, p. 5997; Cohen, Gianaros & Manuck, 2016, p. 460). Cohen, Gianaros & Manuck provide a simplified representation of the primary potential pathways for

stress to induce or increase ill-health seeks to unify what have often been distinct epidemiological (environmental trigger-focused), psychological and biological models. The figure outlines potential feedback loop effects, especially from levels four, five and six to one, two and three:

Figure 1: A heuristic model of the stress process illustrating potential integration of environmental, psychological, and biological definitions



Source: Cohen, Gianaros, & Manuck, 2016, p. 460

These illnesses associated with stress include 'seven of the ten leading causes of death in the United States, United Kingdom and all developed nations': heart disease, cancer, stroke, injuries, suicide/homicide, chronic liver disease and emphysema or chronic bronchitis (Cooper & Quick, 2017, p.1).

The causes of stress are many, but work often and increasingly features centrally. For example, in a survey by Mind (2013), significantly more respondents (34%) reported that their

work life was either very or quite stressful than did financial problems (30%) or health (17%). The existential reasons to regard such phenomena as stress-inducing are evident in the abstract. Today, however, there are many structural socio-economic reasons that link these causes harmfully.

Domination and work-related stress

The UK Health and Safety Executive defines stress as 'a harmful reaction… to undue pressures and demands placed on them at work' (2016, p. 2). It has identified six key factors involved in work-related stress: excessive demands; a lack of control over performance of tasks; a lack of support from colleagues and superiors; damaging relationships, including unacceptable behaviour and bullying; lack of clarity in role or responsibility, and a lack of engagement and consultation during organizational change (Health and Safety Executive, 2017). At least five of these are inherent in modern corporate structures: excessive demands from employees are a natural consequence of the drive for *per capita* productivity (Standing, 2011, p. 49-50); a lack of real control over workload and performance can stem from belief in the need for decisive management and competition both between managers within a company (see Rajan & Zingales, 2001, pp. 808-809) and between companies (see Syverson, 2011); unacceptable behaviour and bullying can stem from individuals needing to uphold their status and authority within a competitive system that emphasizes the importance of hierarchy (see Hales, 2001, pp. 24-38; 120, and implications of Fast, Halevy & Galinsky, 2012); worker consultation and input during times of change is regarded as contrary to organizational prioritization of efficiency (see van Elteren, 2017, pp. 6; 158, etc.), and job losses and diminution of work conditions and pay reflect the need for flexibility (see Gordon, 1996).

This 'corporate experience' renders employees, in Guy Standing's terms, 'denizens': 'partial insider[s]' with some economic, but few or no political rights, subject to '"unaccountable domination"' (2011, pp. 7-8; 9). Domination in this context is often misunderstood. Republican (the tradition, not the party) political thinkers, such as Philip Pettit, have argued that domination consists in being subject to 'arbitrary interference', in which individuals are at the mercy of 'the *arbitrium*, the decision or judgment, of the agent'. The 'agent', in this case, is the manager or employer, who is 'in a position to choose… or not choose…, at their pleasure', with choices made 'without reference to the interests, or the opinions, of those affected', in this case the employees. An arbitrary choice is one that is 'not forced to track what the interests of those others require according to their own judgments' (Pettit, 2006, p. 225). The consequence is that individuals are perpetually in a state of preparedness for threat; always at risk of having their existential interests undermined (see Howard, 2005, pp. 621-622). Individuals who are dominated cannot ever relax their guard; they must always adopt tactics to uphold their interests, no matter how demeaning or unnatural those tactics may appear.

As Standing demonstrates, experience of domination advances in accordance with neoliberal reform aimed at promoting labour force flexibility and productivity. Employees, like asylum seekers or other denizens, often 'lack the capacity to claim or enforce rights, or fear that the act of asserting a claim right would have a high probability of retributive consequences or disastrous costs' (2011, p. 9). For example, although an employee subject to arbitrary and harmful management decisions has the right to appeal to a tribunal, this is a lengthy, costly and uncertain means of upholding interests (Hirsch, 2017). In the UK, if an employee is dismissed on the grounds of alleged 'misconduct', they will be subject to a benefits sanction, preventing them from claiming Jobseekers Allowance, the primary unemployment benefit, for a minimum of 13 weeks (Department for Work and Pensions, 2016). Until a recent Supreme Court judgment ruled it unlawful (Marsh and Elgot, 2017), there was a cost attached to filing a claim to an employment tribunal to appeal against dismissal, with financial assistance provided in a

relatively opaque and discretionary manner (Gov.uk, 2017). If employees are not sacked for resisting domination, they may instead be subject to workplace retaliation, having contractual terms enforced more strictly or being overlooked for promotions (see Vodanovich & Piotrowski, 2014).

Because of this and because of the expansion of low-paid, precarious positions, there are genuine costs attached to seeking and sustaining paid employment. As Standing puts it,

> the old recipe of job creation – "work is the best route out of poverty" – is increasingly wrong and counter-productive. Governments may be able to boost the number of jobs by rolling back labour protections in order to make labour markets more flexible, but in doing so they make many more people more economically insecure. (Standing, 2017, p. 74)

Often, there are good reasons, such as the 'marginal tax rate' attached to entering low paid employment and the increased possibility of domination, to remain economically inactive and to retain the security of whatever 'needs-based' welfare payments that still exist (see Standing, 2017, p. 76-77). The response of Government to reduce those needs-based forms of security merely fosters domination in the name of economic ends that are increasingly unrelated, even rhetorically, to the interests of the population.

Domination, as an institutionalized, inter-subjective phenomenon, can occur within any deeply hierarchical socio-economic structure. There are, clearly, opportunities for, and examples of, domination in slave, feudal, capitalist (Marx and Engels, 1967, pp. 222-224) and state capitalist societies. The majority of forms faced in the present are clearly often less egregious than those in other contexts, but the effect is real and felt nonetheless. This effect is clarified through reference to the epidemiological and evolutionary psychological literatures. In effect, domination serves as a cue for 'extrinsic mortality' by invoking two existential threats – resource scarcity and unpredictability. Being dominated lowers anticipated lifespan and raises anticipation of imminent harm. The consequence is two-fold: people face stress and associated illness and adopt 'adaptively patterned shifts in behaviour, which then become propagated through social transmission' (Pepper and Nettle, 2014, pp. 236-237). These patterns focus on short-term interests, increasing impulsive, sensory and hedonistic behaviour (see Frankenhuis, Panchanathan and Nettle, 2016, p. 76; Páal, Carpenter and Nettle, 2015). Adams et al., for example, found that 'Greater anticipated survival was cross-sectionally associated with lower likelihood of smoking, and higher physical activity levels', while 'Lower anticipated survival was associated with decreased probability of adopting healthier patterns of physical activity, and increased probability of becoming a smoker at follow up' (2015, p. 1). Even those raised in affluent circumstances are only partially protected against the effects in adulthood (Nettle and Bateson, 2017). Whatever the source and structure through which domination emerges, its effect on the body is the same: the epidemiological and evolutionary psychological literatures indicate that domination is deleterious.

Domination and hierarchy

Thinking about domination as a cluster of related cues for 'extrinsic mortality' is important insofar as it helps us to understand data indicating a relationship between hierarchy status and health outcomes, even when phenomenological studies do not identify the cause as domination explicitly. The data on stress indicates that the causes stem from hierarchical relationships. Respondents to the 2009/10-2011/12 Labour Force Survey, for example, reported workload, then lack of clarity and support, then violence, threats or bullying as the three leading causes of stress (Health and Safety Executive, 2016, p. 8). Workload stems from a worker's inability to control their activities, either because they cannot resist their manager's demands or because

they take on increased workloads that they regard as unreasonable in order to advance professionally (see Galinsky, et al., 2004; Standing 2011, p. 20); lack of clarity and role uncertainty speak to individuals' being trapped in conditions of stress response, unable to feel secure against arbitrary interference from their superiors, while violence, threats and bullying are explicit means of demonstrating domination.

The hierarchical source of stress is apparent within research such as The Whitehall Study of Civil Servants. The study, which covers a broad range of social and health topics, revealed that health followed a social gradient (Marmot, Shipley & Rose, 1984): 'the lower the position in the social hierarchy, the higher the mortality from cardiovascular disease and from a range of other major causes of death' (Marmot and Steptoe, 2008, p. 42). This confounds received opinion on 'executive stress', in which those at the top are deemed to deserve enhanced remuneration due to the exceptional stress associated with responsibility. Whitehall demonstrated that Civil Servants at every level experienced greater stress than those above them in the hierarchy, including those one step away from the top level of management (Marmot, 2006, p. 1304). These deputies are endowed with significant status and power and are remunerated accordingly. However, they remain subject to domination by those occupying the one remaining 'superior' tier.

Civil Servants, in general, are not subject to objective levels of poverty, so could not suffer from resource scarcity, while standard risk factors for mortality (cholesterol, smoking, systolic blood pressure, glucose intolerance and diabetes) explain only a third of social gradient's predictive power (van Rossum et al., 2000). A follow-up study, Whitehall II, examined the likely psychosocial factors at play (Marmot and Steptoe, 2008, p. 42). The results indicated that, in general, the magnitude of psychobiological stress response to tasks was not strongly related to the social gradient. Rather, those of lower socioeconomic status (SES) experienced delayed recovery and prolonged activation of stress markers after the task had ended (Steptoe, et al., 2002; Marmot and Steptoe, 2008, p. 48). The levels of other markers were greater for those in lower occupational grades on workday mornings. Markers included those for ambulatory blood pressure (Steptoe, et al., 2003), which has been associated with increased risk of cardiac events (Giles, 2006), and cortisol awakening response (Kunz-Ebrecht, et al., 2004), which has been found in those experiencing depressive symptoms and work and financial stress (Pruessner, et al., 2003) and appears to be an indicator of stress-related hypothalamic-pituitary-adrenal dysfunction (Chida & Steptoe, 2009). Both an excessive secretion of cortisol in response to stress and a slow recovery from its effects after repeated exposure are consistent with Cohen's model of the development of glucocorticoid resistance.

While executives experience unpredictability, they do so without the exposure to domination as described above: unpredictability more often stems from circumstance or from the actions of those without direct control over their lives, such as executives in other companies and organizations (see Worrall and Cooper, 1995, p. 10). Moreover, executives are the first to receive information, have power to dismiss requests and to delegate tasks to respond to changing circumstances (see discussion in Wulf, 2012, p. 6). Those operating at lower levels of the hierarchy operate under conditions of domination, even when they are relatively well-remunerated. Individuals may have experienced domination for much of their lives, meaning that they are in a continuous state of preparedness for unpredictable demands. As the epidemiological and evolutionary psychological literatures suggest, this experience of firefighting or short-term survival thinking, rather than long-term planning, renders individuals, on a psychobiological level, less able to progress professionally, which is especially unfortunate given that such progress up a hierarchy has been shown to improve health (see Marmot 2004b, p. 152).

The burden that dominated individuals face has been explored by Mullainathan and Shafir (2014), who have coined the notion of the 'psychological bandwidth tax'. In common

with even a modern, high-powered computer, every individual has a limited capacity for dealing with tasks, especially those inducing stress. When overloaded with tasks, the mind lacks the necessary psychological resources by which to function. To substantiate their thesis, Mullainathan and Shafir presented participants with a scenario in which their car required maintenance, but their insurance would cover only half the cost of a $300 service. The service is an objective benefit in which future damage, and further costs for repair, could be avoided, but with an up-front cost. Participants were asked to consider whether they would pay for the service or hope that it lasted longer and risk doubling the prospective $150 deficit. They were also questioned how, and with what difficulty, they would go about making such a decision. Others were asked the same question but with a $3,000 service cost. The authors followed this with a series of Raven's Matrices problems, which are used to measure fluid intelligence and are common in IQ tests, and divided participants into rich and poor cohorts based on median income. Those required to find $150 were relatively unaffected by the scenario. However, when faced with a $1,500 deficit, those with lower incomes were significantly less able to respond to Raven's Matrices problems by virtue of their psychological bandwidth tax (2014, pp. 48-51).

Mullainathan and Shafir focus on the effect of resource scarcity on cognitive functioning (see also Mani et al. 2013). However, their approach is compatible with concern for domination insofar as domination works by threatening resource scarcity as the consequence of employees' actions or inactions. Indeed, they accept relativity of scarcity, suggesting that even those above the poverty line can be burdened by the tax. While wealthier individuals may not be impaired by the scenario above, they may be burdened by a scenario in which they are faced with a deficit of $15,000 (see Mullainathan and Shafir, 2014, p. 11). The point is that resources insure us against extrinsic threats to our survival. Those on higher wages may be more protected, but domination still triggers the stress response on account of threatening destitution or an intolerable quality of life. As such, the work of Marmot (2004a) shows that absolute poverty is only part of the problem. Relative position within hierarchies, indicated in part by relative wealth, has the capacity to inflict absolute deprivation in health. As Marmot (2004b, p.153) puts it,

> A way to stress an animal, of the human or non-human variety, is to remove control. This is true whether the animal or person is high status or low status, but low control is more common the lower down the pile you find yourself. Low grade chronic stress, acting through the brain, mobilises hormones – cortisol and adrenaline and noradrenaline – that lead to profound biological changes. Among these is likely to be the metabolic syndrome, linked to insulin resistance that increases risk of diabetes and heart disease.

The consequences of the subjective activation of stress response according to social status have been mapped in a meta-analysis by Tang, et al. (2016), who contend that low Subjective Social Status (SSS), or an individual's perceived position in the social hierarchy, significantly increases odds of coronary artery disease, hypertension, diabetes and dyslipidaemia, with a trend toward increased odds of obesity (p. 1). This builds on the findings of Whitehall II, confirming that the gradient follows more objective measures of SES within whatever hierarchy individuals inhabit, but highlighting that 'increasing evidence suggests that low SSS may have adverse effects on health due to internalization of perceptions of inferiority resulting in activation of stress-related neuroendocrine mechanisms, and increased tendency to participate in behaviours that may negatively influence health' (Tang, et al., 2016, p. 2). The psychobiological effect, therefore, is not just the result of one's objective position in a hierarchy, but an individual's perception of that position in the hierarchy: hierarchies create

scope for domination and perception of hierarchies influences the extent to which domination is deployed perniciously.

This pushes back at the social Darwinian notion of status as health selection (see Marmot 2004a, pp. 58-60). In this account, 'ill-health determines social position, not the other way round: good health leads to winning the Oscar' (Marmot 2004b, p. 152). Rather, capacity emerges, in part, by virtue of inhabiting a particular social position, whether that position is reached through systemic advantage or otherwise (see Marmot 2004b, p. 152). The benefits of holding and retaining a position of domination within hierarchies has been demonstrated in a more practical context by Knight and Mehta (2017) who suggest that high social status confers benefit in reducing experience of stress when challenged by a social stressor (a mock job interview), but improves performance only in a stable hierarchy. There is no such benefit in an unstable hierarchy. Those in higher positions in the hierarchy, therefore, have both a strong material and physiological interest in maintaining domination, locking those below them in perpetual conditions of stress.

A social approach to tackling the social health gradient

At present, the approach adopted to dealing with stress-related illness and disease is to treat medically individual patients as they present themselves symptomatically. This either neglects and fails adequately to deal with the social bases of the health crisis or reflects a neoliberal assumption, with social Darwinian implications, that stress and ill-health are inevitable consequences of employment to be addressed individually by sufferers themselves. We argue that, on health grounds alone, there is good reason to reject this approach and to consider means of reducing domination.

In order to promote health, we need to promote what the republican thinker, Philip Pettit, has termed 'freedom as nondomination' (2006, p. 225), in which no individual has 'the capacity to interfere in another's 'affairs on an arbitrary basis' (1999, p. 165). The state may still interfere in people's lives, through compelling taxation, for example, but only within a resilient institutional framework that precludes partial acts 'that worsen the agent's situation – or at least worsen it significantly – either by reducing the alternatives available in choice, or by raising the actual or expected costs associated with some of the alternatives' (2006, p. 225). The point, here, is that republicans distinguish between conditions in which two individuals experience similar levels of non-interference: one is a dominated slave who relies upon the grace and favour of their master; the other is a non-dominated citizen who exists within a resilient institutional structure that guarantees liberty. The slave is subject to contingent non-interference, while the citizen experiences resilient non-interference. As Widerquist (2013, p. 27) puts it, in order to secure real freedom for individuals, they must have 'the power to say no'. Workplace stress stems from the absence of the power to say no, even when there is no interference. It is the ever-increasing lack of resilient non-interference that renders them unwell.

Pettit specifically identifies means of challenging such forms of domination 'by introducing a form of social security that would make the prospect of losing a job less than wholly intolerable' (1993, p. 26). More recently, discussion has shifted toward the introduction of UBI (see, for example, Taylor, 2017, pp. 22; 54), which is one of a range of approaches aimed at ensuring that all citizens receive a minimum income. In UBI, the government provides an unconditional monthly stipend to all adult citizens. There are no forms of means testing, work requirements or potential sanctions (Wright, 2006, p. 5). The approach seeks to ensure that no citizen falls below the poverty line and that all are free from interference to engage, or not engage, in economic activity suited to their circumstances, talents or interests (Wright, 2006, p. 6). In so doing, proponents such as Standing (2011, pp. 171-173) argue that UBI is pragmatic: it does not seek fundamentally to challenge capitalism; instead, it eliminates the

onerous administrative exercise and expense of means-tested welfare and is grounded in rights-based liberal thinking. However, there is reason to believe that the policy has scope for significant impact: it releases or relieves workers from workplace domination, such that employees can refuse to acknowledge arbitrary managerial demands and resign from positions safe in the knowledge that their basic needs will be satisfied (see Pettit, 2007, p. 6). Although Birnbaum and De Wispelaere (2016), among others, argue that capacity for exit is less clear cut insofar as resignation imposes other costs, those costs are greatly reduced in comparison to existing welfare systems that actively punish workers who resign. This all suggests scope for reducing stress, expanding psychological bandwidth and improving health.

Evidence drawn from trials indicates a positive effect on health. The 1974-1979 trial of MINCOME, a Canadian Guaranteed Annual Income (GAI) was conducted in the province of Manitoba. Unlike UBI, MINCOME included a means testing element with a tapered payment based on other sources of income. The study 'found a significant reduction in hospitalization, especially for admissions related to mental health and to accidents and injuries, relative to the matched comparison group. Physician contacts for mental health diagnoses fell relative to the comparison group' (Forget 2011, p. 0). Some such pilots have included evaluation of psychological benefits, including stress as a psychological state. Indeed, phenomenological data from Finland indicate a reduction in stress (Independent Staff 2017). Psychologists are increasingly making a public health case for UBI on account of its effect on mental health, calling for UK trials 'incorporating psychological impact measurements, including the healthy social indicators of sense of agency and control; uncertainty and security; connections with others; sense of meaning and purpose in life; and social trust and cohesion' (Psychologists for Social Change 2017, p. 3). We argue that the medical literature on the effect of stress on health give good grounds for exploring such impacts more clearly, specifically with regard to psychobiological effects. Indeed, medical and social researchers have begun to use findings from investigations into the socio-economic contribution to inflammatory biomarkers (see Davillas, Benzeval, & Kumari, 2017) to develop policies by which to reduce their impact, recommending, for example, early retirement for those in more stressful positions (see Arney, 2017).

At present, evaluation of UBI focuses, understandably, on its effect on poverty as an independent variable in determining health outcomes. Forget (2011, p. 2) contends that the health benefits of MINCOME were secured via a reduction in poverty, while The Public Health Agency of Canada (2016) notes the importance of 'upstream investments', addressing 'social, economic and environmental conditions'. Others have noted the social health gradient and recognized the importance of promoting policy based on reducing 'health inequalities, the structural conditions that put people "at risk of risks"': 'discrimination, poverty, residential segregation, inadequate schools, unemployment' (Thoits, 2010, S47). Domination presents each of these factors as threats that constitute extrinsic mortality cues. As such, proponents of UBI would be better served examining the broader effect of UBI in minimizing domination as the basis of its effect on health.

Public cost and public benefit

The debate on UBI is broad and considers many prospective costs and benefits that are beyond the scope of this paper and discussed in depth elsewhere (see OECD, 2017; Martinelli, 2017; Standing 2017). Most clearly, though, that debate has often returned to concern for financial feasibility (see Lewis, Pressman, & Widerquist, 2005). Abstracted from progressive revisions to income tax rates and comparison with existing costs associated with current welfare arrangements, the notion of allocating a monthly stipend even to the richest seems absurd. However, there are grounds for regarding the scheme as part of a broader redistributive regime with concomitant deployment of increased tax rates for higher earners (see discussion in, for

example, Pelzer, 1999) and/or the introduction of a Land Value Tax (see Robertson, 1999) or the imposition of a flat income tax rate of 30-50% that is progressively negated by UBI for lower earners (Atkinson, 1995, esp. pp. 24-46; Straubhaar, 2017). Whatever the model, it is clear that the system offers prospective benefits to those significantly above the poverty line (see OECD, 2017).

The benefit to more affluent citizens in terms of reducing their exposure to stress has seldom been granted sufficient attention. This is of particular justificatory importance in affluent countries, such as the UK, in which the average rate of poverty ranges between around a quarter to a fifth of the population and those at risk of persistent poverty around one in 15, compared to 1 in 10 in the EU (Office for National Statistics, 2016a). In such contexts, concern for addressing the poverty of the 6.5% of the UK population at risk of persistent poverty, can be supplemented by concern for the 15 million people affected by long-term stress-related illness (Department of Health 2012, p. 5).

Promoting health among such a large proportion of the population offers potential means of reducing the burden on the NHS and increasing workplace productivity. The policy would substitute a single payment administered by a streamlined Department for Work and Pensions for existing welfare spending, which accounted for £258bn of UK public spending in 2014/15, including £108bn on pensions, £44bn on family benefits, income support and tax credits, £41bn on incapacity, disability and injury benefits and £27bn on housing benefits and just £3bn on unemployment benefits (Office for National Statistics, 2016c). Martin Farley (2016) has demonstrated how a UBI of £7,200 for all adult citizens in the UK and pensioners living abroad, some 53 million people, would be feasible fiscally with the introduction of a flat tax rate of 35% on all income that would, in effect, cancel out income tax for the lowest 45% of earners. His calculations include additional 'spare' income for the Government to be spent on benefits for those who require further assistance, such as those with disabilities, housing needs and contribution-based pensions.

There are, though, several reasons to revise such an approach and qualify its potential benefits. Firstly, the level of UBI hardly stands as a viable alternative to well-remunerated employment with domination. Beyond mere survival, the level of income at which a life becomes liveable has a subjective element – high earners may regard even median earnings insufficient (Bamfield, & Horton, 2009). In this regard, adjustments to the formula, which does not include the substantial savings to be made from streamlined administration, could be made to increase the UBI to a level of around £10,000-£15,000 at which basic needs can be met. Secondly, calculations of cost do not account for the possibility of reducing health and social care spending, which amounted to approximately £170bn in 2015/16 (Luchinskaya, Simpson, & Stoye, 2017, p. 142), and improving productivity, given that 139 million work days are estimated to have been lost to sickness absences in 2015, with 15 million the direct result of stress, anxiety and depression (Office for National Statistics 2016b). However, judging savings to the NHS and welfare spending overall is extremely complicated, not least insofar as improving public health means increasing life spans which, in turn, increases the length of time in which individuals require the greatest number of medical interventions. Thirdly, retaining any needs-based monetary element may sustain elements of the benefits trap insofar as individuals lose income as they become healthy, subjecting individuals to domination by virtue of health assessments. As such, there is good reason to favour a system based solely on a single, unconditional payment combined with increased investment in public health and care services for those in medical need that confer no monetary advantage on recipients. The investment in institutions is especially important insofar as, as the Nordic Model has demonstrated (see Arnesen, & Lindahl, 2006), there is need for institutionalization of norms to encourage citizenly participation in work once domination has been challenged. Finally, UBI may serve to challenge domination in work, but would not deal with other sources of stress that are

commonly implicated in physical and psychological ill health, not least traumatic life events (van der Kolk 2014).

However, even with these qualifications, at a time in which UK public support for tax and spending is at its highest in over a decade (see Harding 2017, pp. 3-5), there is potential political will for trials which evaluate a contribution to health that has been neglected by UBI proponents.

Conclusion

UBI is gaining traction on both the left and right of the political spectrum for a range of reasons, including increasing precariatization and automation of work and inefficiencies in needs-based welfare systems. If we accept the validity of the literature on the psychobiological effect of stress, the insights gleaned from Whitehall II provide good grounds for examination of the effect of UBI on domination and, in consequence, health. We contend that it is this specific contribution that offers the most significant potential impact of the policy and argue that proponents ought to draw more clearly and heavily upon the medical literature in order to advance the case.

Long-held opposition to UBI on account of cost and disincentive to work needs to be evaluated within this broader public health context, since the full effect on public finances beyond welfare spending abstracted from amendments to tax codes has seldom been considered. Moreover, cost-based opposition has often been grounded ideologically in neoliberal dogma, holding that corporate hierarchies are essential to delivering efficiency and that cliff edges are important means of incentivizing success. Non-manager-based enterprises, including Ricardo Semler's Semco Partners and the Mondragon Corporation, have demonstrated the power of flat organization (see Herr, 2009, p. 14; Kastelle, 2016), with workers contributing to decision making and possessing the capacity to move between projects. Such organizations have experienced enhanced productivity and growth precisely because they minimize domination. In other words, even according to their own standards, neoliberals propound inefficient systems. As such, given the potential contribution to health, pragmatic governments have every reason to evaluate UBI with regard to public health. To this end, we call for all trials and studies of UBI to measure physiological indicators of stress responses among all participants, whether in work or not.

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