2 *The Cost of Trauma*

I felt a Funeral, in my Brain,
And Mourners to and fro
Kept treading – treading – till it seemed
That Sense was breaking through –

And when they all were seated,
A Service, like a Drum –
Kept beating – beating – till I thought
My mind was going numb –

And then I heard them lift a Box
And creak across my Soul
With those same Boots of Lead, again,
Then Space – began to toll,

As all the Heavens were a Bell,
And Being, but an Ear,
And I, and Silence, some strange Race,
Wrecked, solitary, here –

And then a Plank in Reason, broke,
And I dropped down, and down –
And hit a World, at every plunge,
And Finished knowing – then –

—Emily Dickinson, 'I felt a Funeral, in my Brain'

2.1 Chapter Outline

Traumatic experience matters. Trauma isn't some post-millennial concern. In fact, the idea that trauma has pathological effects has been around for a long time. In this chapter, the costs of trauma in terms of death and disability are considered before turning to the mental health

https://doi.org/10.1017/9781009306997.003 Published online by Cambridge University Press

costs of trauma. The World Mental Health (WMH) surveys are used to consider the global cost of post-traumatic stress and the associated disorder, post-traumatic stress disorder (PTSD). Both are believed to flow directly from traumatic experience. Trauma also has a significant human cost, driving incidence of substance misuse and depression (Contractor et al., 2014), which can be thought of as relevant comorbidities. The potential for symptoms of post-traumatic stress to be misinterpreted and for affected populations to be pilloried because of their trauma is also considered. Finally, the social and economic burdens of trauma are reviewed. Trauma can contribute to poverty, disability and underemployment, migration of populations, family separation and homelessness, all of which carry significant social and economic costs.

2.2 Are We All Traumatised?

Recently, during a meeting with a student, we were reviewing a standardised psychological tool that measured adverse child experiences. I was surprised by my high score. It would appear at least in terms of childhood, mine was a life that could be characterised as having adverse childhood experience. And indeed, over the years, there has been more than one occasion where I have recounted a tale from childhood and the listener, rather than laughing as I expected, was aghast at the tale. This does not at all chime with my sense of myself. I see myself as having lived a charmed existence.

Of course, like so many others, over the years there have been various events that have caused me considerable distress, some that I even think have changed me. In my first year of college, an acquaintance died whilst we took an exam. It was the first time I had heard of sudden adult death syndrome. In my final year of college, a friend was shot dead whilst working for an aid organisation in Somalia. I was very deeply upset by this and promised myself I would be forever mindful of news reports and acknowledge every life lost through unexpected and violent death. My son was taken from me in something of a panic when he was two days old. He needed emergency treatment and admission to neonatal ICU to make it through his first week of life. Happily, it was a reasonably short-lived crisis, and I have got to value him as I promised myself I would on that awful night. A close friend died by suicide in my late thirties, and this was followed very quickly

https://doi.org/10.1017/9781009306997.003 Published online by Cambridge University Press

by my husband receiving a life-threatening health diagnosis. The bereavement, followed so closely by my husband's health crisis, was difficult and was followed by a period where I really struggled to cope. But I did manage and even learned from that period of stress. My parents' deaths, within nine months of each other at the start of the COVID-19 pandemic, were similarly difficult. Still, mostly I emphasise to myself how lucky I was to have them in my life for fifty years and how lucky I have been in life.

Although this is not a comprehensive list of my traumatic experiences, it is certainly enough to make my point. Like pretty much everyone you will meet, I have had my fair share of challenges in life. Life can be very cruel. Despite this, I have always considered myself to be privileged, lucky even. Though I don't see myself as someone who endured childhood adversity or had a traumatic life, and whilst I try to emphasise the positives from my experiences and the lessons learned, in reality, I didn't always manage what life threw at me very well. Sometimes my body let me down and I got sick. Other times, how I felt and how I thought was affected. I got depressed: 'a funeral in my brain' and 'my mind was going numb' so to speak. Negative feelings of this type tended to cause a spiral downwards. When I became stressed, I often overate, over-consumed alcohol and had an on-and-off relationship with cigarettes. In effect, there were very many occasions where I have been my own worst enemy, responding with unhelpful or unhealthy behaviours.

This obviously made the situation worse. As well as being upset by stress, I also became upset with myself about my perceived failure to manage my emotions and my dysfunctional and unhealthy responses. Responding in a dysfunctional way to life's difficulties is common – I don't have a monopoly on that. Substance misuse in response to feelings of distress and hopelessness are also common. In my case it is no coincidence that the drugs of choice are culturally acceptable substances to misuse in Ireland, particularly amongst my generation. And oddly, though I value my identity as a psychologist and know a lot about the nature of depression, I was slow to recognise it in myself. Instead, I berated myself for not being able to cope. I offered, and saw myself as deserving, little or no compassion.

I was eventually diagnosed, by someone else, with depression. And despite all that I knew as a psychologist, I experienced that diagnosis as a personal failure. I truly felt 'wrecked'. I had become guarded and, as

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Emily Dickinson says in her poem, 'solitary', in part because of these feelings of inadequacy and failure, and in part because I was irritable and tired. This placed a strain on my relationships with other people, including those close to me. Eventually, after getting over the monumental hurdle, which was the admission I couldn't manage alone, I accepted pharmaceutical and psychological treatments. Despite being a so-called expert in this area I had a problematic blind spot. I had a lot of very negative perceptions about depression and depressed people that prevented me from identifying as such and therefore got in the way of my seeking help. My mother's support, and her account of successfully adapting to depression after becoming a mother helped me to leave some of these negative feelings behind. Looking back, I find it astonishing how long it took me to get to the point where I accepted help and accepted that I needed help: it was a long road to Dickinson's 'sense … breaking through'.

Seeing the situation for what it was allowed me to move forward. As the years have gone by, I have made a concerted effort to use running, rather than food or drink, as a means of managing my distress when life throws curve balls. It is, I think, infinitely better than artificial substances, though some argue that running also has addictive properties. In my case running has the additional benefit of offering social interaction: I run with friends and I make friends when I run. And my desire to run restricts overeating and drinking alcohol. Once I realised running was key for me in terms of managing my own mental health, I prioritised it. And I learnt some other lessons too. I am now a bit kinder to myself than I was in my younger days. Now when I fall off the wagon, I remind myself that mental health is not a fixed or static state. It has multiple dimensions. Our mental and physical health are ongoing projects affected by the vagaries of life.

2.3 The Mental Health Costs of Trauma

The experience of trauma is implicated in a range of mental health disorders as well the group of problems known as 'trauma and stressor related disorders'. PTS has a significant human cost in terms of death and disability. Chronic trauma such as child abuse has been linked to personality disorders (Jowett et al., 2020). Trauma such as bereavement and life-threatening illness have been linked to depression (Zisook & Kendler, 2007). And substance misuse and addiction

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disorders have also been linked in longitudinal population studies to trauma exposure (Hedtke et al., 2008). There is also a significant overlap between these disorders. Depression, anxiety disorders and substance misuse are frequently comorbid with trauma-related disorders such as PTSD (Mason et al., 2019). Indeed, the co-occurrence of PTSD with another disorder is the rule rather than the exception. Trauma, as well as having a high human cost, has a wide-ranging impact and affects multiple mental health outcomes.

2.3.1 Stress and Trauma-Related Disorders

In terms of mental health the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) has specifically recognised trauma- and stressor-related disorders in their own specific category. The DSM-5 offers three main stress response diagnoses in adults (PTSD, acute stress disorder and adjustment disorder) and two in children (reactive attachment and disinhibited social engagement disorders) that are a reaction to specific triggering events (Wakefield, 2013). PTSD is without doubt the most widely known health condition arising from trauma. It is a diagnosable mental disorder, popularised in literature and film (e.g., to critical acclaim in *Born on the Fourth of July*). Indeed, the criteria for diagnosis are only met if the symptoms experienced as a result of trauma are severe and prolonged enough to interfere with a person's social and occupational functioning.

The 1980 edition of the DSM (3) categorised PTSD as a mental PTSD (Spitzer et al., 2007). Though first classified as an anxiety disorder, it has subsequently been reclassified as a 'trauma and stressor-related disorder' in DSM-5 (APA, 2013). It is clear that the emotions involved in PTSD are not by any means restricted to fear, helplessness and horror, or to what was actually experienced at the time of the trauma. Although anxiety- or fear-based symptoms are experienced in individuals with trauma- or stressor-related disorders, they are not the primary symptoms. Indeed, people affected by trauma- or stressor-related disorders typically report a state of unease (dysphoria), numbness or inability to feel pleasure (anhedonia) and disconnection from their own thoughts, feelings and experiences (dissociation). Externalising symptoms such as aggression and anger are also reported. The poet Emily Dickinson articulates this constellation of feelings in her poem that appears as the epigraph to this

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chapter. Her unease is represented by the ‘treading – treading’ and the ‘beating – beating’ – until she thought her ‘mind was going numb’. There is dissociation evident in the poem’s conceit of a funeral occurring in her brain, but equally dissociation is very clearly referred to where the poet’s voice is separated even from humanity ‘Being, but an Ear / And I, and Silence, some strange Race’. In many regards this poem, though usually interpreted as one describing a descent into insanity, speaks to the toll that trauma can take. It removes much of the joy from life.

The symptoms of PTSD that people experience are demonstrably linked to culture (Smelser, 2004). The DSM outlines symptoms of PTSD in pre-defined clusters or factors. The exact number of symptom clusters is debated, and the pattern of symptoms across anger, dissociation, anhedonia and dysphoria varies (for a review, see Armour et al., 2016). Emily Dickinson wrote her poem in the nineteenth century; it was first published in 1896 but was, as most scholars agree, likely to have been written in 1861 (Perriman, 2009). Dickinson was born into a prominent family in Amherst, Massachusetts. She lived a very isolated and solitary life. She never married, which, given the norms of the time, restricted her socially. Historical commentators on Dickinson have suggested that her early life was beset by traumatic abuse including incest and later bereavement (Perriman, 2009). Expression of anger or aggression, particularly by women of her class, would have been a culturally inappropriate response, and thus abuse of the type she suffered was rarely acknowledged or discussed. This may explain why anger symptoms don’t make an explicit appearance in her poem. However, even artists, and most especially women from previous eras, worked their realities and rebelliousness into their works to avoid cultural costs of speaking out (Jaspar, 2008). And so in this way we can see the poem itself allows her to speak out. It alludes to – ‘and then a plank in reason, broke’ – and is symptomatic of anger, a key externalising symptom of post-traumatic stress.

In total, the DSM-5 argues that there are eight necessary criteria for a PTSD diagnosis. The first is the experience of a traumatic event (criterion A). The second set of criteria relate to the symptom expression across four clusters (Bisson et al., 2015). These include, as already mentioned, persistent negative alterations in cognitions and mood associated with the traumatic event (e.g., anger, guilt, difficulty concentrating), intrusion symptoms (e.g., flashbacks, nightmares), avoidance

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of trauma reminders (e.g., avoiding 'trigger' situations) and alterations in arousal (e.g., difficulty sleeping). In DSM-5 (APA, 2013) a diagnosis of PTSD is seen to be warranted where there are multiple symptoms across these clusters and they are understood as persistent by a clinician (criterion F) and causing significant functional impairment (criterion G) and which are not attributable to other causes (e.g., the physiological effects of substance use or medication: criterion H).

As alluded to already, there is another school of thought, however, that sees the labelling and classification of PTSD as a disorder as problematic. Some commentators advise that it is better to think of all responses to trauma along a continuum of post-traumatic stress (PTS). Proponents of this view would argue that stress responses can be considered reasonable, normal or, indeed, expected reactions to extreme or distressing events (Summerfield, 2001). Thinking in this way encourages us to think about symptom severity. And it avoids the labelling of symptomatic individuals as 'disordered'. This gets around some of the negative feelings associated with a mental health diagnosis. Certainly, when I was diagnosed as depressed it felt like an additional burden. And, sadly, this is the way many people, myself included, continue to experience mental health diagnoses. It is also a reason that people struggle with admitting they need help (Kearns et al., 2015), in the way I did. So, thinking about responses to traumatic experiences as PTS rather than PTSD is thought to minimise barriers to seeking help as well as preventing the pathologising of traumatised people. We move away from a dichotomy between those who do or do not warrant a clinical diagnosis. This approach, rather than labelling people who are distressed by extreme events, turns attention to the social conditions that gave rise to traumatic experiences.

The value of avoiding labelling people is amplified by the fact that trauma exposure is so common throughout the world. More than two-thirds of all respondents in the WMH surveys report experiencing a trauma at some point in their lifetime. Without question, my life experience is the rule rather than the exception. The most common response to extreme and distressing events, including war, political violence, rape and sexual assault, accidents and natural disasters, is resilience to their impact (Agaibi & Wilson, 2005). Many people show some PTS in response to extreme or distressing events, but these responses often are short-lived and/or not so severe that they interfere with social or occupational functioning. So, though there have been

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very many incidents in my life that could be considered traumatic, for the most part, after a period of distress I managed to move on. This is borne out in the research that we have available. For example, using representative samples it has been shown that whilst 50 per cent of people in Northern Ireland have been exposed to more than one traumatic incident as a consequence of political violence (Schmid & Muldoon, 2015), only one in ten shows symptoms severe enough to warrant a diagnosis of PTSD (Muldoon & Downes, 2007). Similarly, cross-national longitudinal representative surveys of Israelis, Palestinians and residents of Northern Ireland indicated that while PTS responses severe enough to warrant a diagnosis of PTSD were more prevalent in these samples than in populations unaffected by political violence, they were still only evident in a minority of the population. So, even amongst those who reported direct and repeated exposure to trauma, 75–80 per cent did not warrant a diagnosis of PTSD (Hirsch-Hoefler et al., 2021). Accordingly, understanding the basis of psychological *resilience* to trauma is just as important as understanding vulnerability.

That said, we also know that the number of years lost to trauma-related disability is considerable. And though trauma is common, the experience of trauma is not evenly or equally distributed (Muldoon, 2013; World Health Organization, 2011). Take gender, for example. Tjaden and Thoennes (1998) estimate that each year 4.8 million acts of violence are committed against women and 2.9 million acts of violence are committed against men in the United States alone. Not only do these experiences have a profound effect on these individuals; they also affect others, including children exposed to this violence. Estimates are that each year in the United States 17.8 million children are exposed to domestic violence, either as witnesses or as targets (Evans et al., 2008). And we know trauma *type* matters – both to the risk and to the persistence of mental health symptoms. Exposure to intimate partner sexual violence accounts for nearly 42.7 per cent of PTSD evidenced across the twenty-seven countries that participate in the WMH surveys (Kessler et al., 2017). Being both an intentional act of harm and one that undermines our sense of trust even of those with whom we are closest (see Section 1.4), this type of trauma is particularly pathological.

Though statistics reported from various countries are not directly comparable, the WHO (World Health Organization) offers important insights into PTSD prevalence and patterning. The estimates for

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lifetime PTSD prevalence range considerably between countries, from a low of 0.3 per cent in China to 6.1 per cent in New Zealand (Kessler et al., 2009). There appears to be very different consequences of trauma, likely related to people's capacity and capital to manage traumatic stress across countries. For example, most war survivors live in low- to middle-income countries, and estimates of the impact of war suggest that, globally, the number of adult war survivors living with PTSD is huge (Hoppen & Morina, 2019). There were an estimated 1 billion adult survivors of wars fought between 1989 and 2015 alive in 2015, and based on geo-referenced data on armed conflicts a further 450 million children (data from the Uppsala Conflict Data Program, Petterson & Eck, 2018; Pettersson & Wallensteen, 2015). Using a meta-analytic approach to synthesise available data, Hoppen and Morina (2019) estimated that in 2015 there were approximately 242 million adult war survivors living with PTSD. Of these, about 117 million live with comorbid PTSD and major depression. While approximately one-third of cases recover from PTSD within a year, rapid recovery appears to be least likely amongst people with war-related symptoms (Kessler et al., 2017). Indeed, PTSD symptoms following war-related traumas have the longest median duration, at five years, followed by traumas involving physical or intimate partner sexual violence (with a median of three years).

In summary, psychological responses to trauma vary in degree and can change over time. Even in response to the same event, some people will show resilience and others severe symptoms of PTS. And though there will be other times when people struggle, our responses to traumatic events are often marked by resilience. In some cases, symptoms experienced as a result of trauma are severe enough to interfere with a person's social and occupational functioning and well-being. A diagnosis of PTSD can then ensue. Consequently, recent research efforts have largely focused on identifying those who are at increased risk of poor mental health outcomes if they are exposed to traumatic experiences (Bomyea et al., 2012). As we will see in the next chapters, a significant proportion of this variability is linked to social connections, social status, power and politics. This does not diminish the contribution of work that has explored other dimensions of traumatic responses, but rather highlights how group and social identity processes are integral to both experiences and responses to trauma – and hence that those same processes need to inform the way trauma is understood and managed.

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2.3.2 Dual and Diverse Consequences of Trauma Exposure

Though trauma and PTSD have their own category of disorder in the DSM-5, in the real world, the psychological problems that people experience because of traumatic experiences are rarely clear-cut. It is apparent that many people living with PTSD have comorbid problems or dual diagnoses. For example, approximately half of the 250 million people living with war-related PTSD live with comorbid major depression (Kessler et al., 2017). Stewart's (1996) important early review of the literature concluded that trauma-exposed individuals with PTSD have a higher risk of alcohol abuse than those without PTSD. Later epidemiological studies showed the same pattern with regard to drug abuse (Reed et al., 2007) and tobacco use (Breslau et al., 2003). It is now estimated that individuals with PTSD are four to five times more likely to have a substance misuse disorder, at some point in their lives, compared with individuals who do not have PTSD (Brady et al., 2021).

In this way we can see that traumatic experience is linked to both PTS and other related psychological problems. Importantly, people who have comorbid diagnoses tend to have higher health costs. The Australian National Survey of Mental Health included 10,641 people and showed that individuals with substance use disorder and comorbid PTSD have significantly poorer physical and mental health and greater disability than those with substance use disorder alone (Mills et al., 2006). Using data from the US National Health and Resilience in Veterans Study (N = 2,732), Nichter et al. (2019a) similarly showed that the health burden of PTSD and comorbid depression was far greater than one of these diagnoses alone. Further, comorbid depression and PTSD were associated with a three times greater likelihood of disability than depression alone and was also associated with a diagnosis of heart disease and cardiovascular risk. Indeed, the evidence is that dual diagnoses are linked to disability (Campbell et al., 2007), health care utilisation (Chan et al., 2009), suicidality (Cougle et al., 2009) and poorer quality of life (Nichter et al., 2019b). The coincidence of PTSD and depression, and PTSD and substance misuse in this way imposes a greater cost on people's mental health and well-being than either condition alone (Flory & Yehuda, 2022).

There is a second way in which the divergent consequences of traumatic experience need to be considered. PTSD is unique in terms of mental health diagnoses as it stipulates its own causation. However,

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there are other disorders where traumatic experiences and adversity are seen and theorised to be relevant (Broeman, 2020). Childhood trauma, for example, is an important risk factor for the development of borderline personality disorder (BPD; Ball & Links, 2009). BPD was postulated originally to be a disorder inherent in people's character; now it is increasingly seen to arise from the problematic impact of childhood trauma on interpersonal relations. Typically, someone with BPD has problems in interpersonal relations. This has all sorts of costs for those affected in terms of their ability to engage and integrate in social, health, educational and occupational settings. And it can give rise to further health and well-being costs. BPD, then, though not often thought of as a trauma- or stressor-related disorder, arises from traumatic experiences and can have very high personal and socioeconomic costs (Luyten et al., 2020).

Taken together, this work tells us that the mental health implications of traumatic experiences are not clear-cut. People can have more than one set of symptoms and even more than one diagnosis. These can include depression and substance misuse (e.g., alcohol and drugs). People who experience trauma early in life may develop a pattern of behaving that means that they are characterised as having a personality disorder. Reliance on substances such as drugs, alcohol and cigarettes can become problematic and affect physical health outcomes. Reliance on these substances is sometimes a habit that traumatised people have developed to manage their own distress – often referred to as self-medication. Looking back, I can see these patterns in my own mis(use) of alcohol and cigarettes over the years. Relapse is common during times of distress or when further trauma is encountered. And it can be very difficult for people to kick these habits whilst they remain distressed. Understanding the varied and sometimes self-defeating ways in which people respond to trauma has given rise to calls for trauma-informed care (Racine et al., 2020). This approach shifts the focus in health, education and social care settings. Rather than seeing traumatised people as problematic, it acknowledges the wide-ranging impact of trauma in the hope of identifying potentially adaptative practices and pathways (Muskett, 2014).

2.4 The Physical Health Costs of Trauma

Since an acute physiological response to stress, commonly known as the flight or fight response, was first documented, a growing

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appreciation of the impact of stress on physical health has developed. This acute stress response has three phases, during which hormones are released to prepare the body to face imminent stress.. This is the first of two pathways through which trauma can affect physical health. The first pathway, a physiological pathway, is linked to these hormonal responses and their effect on biological markers of health, sometimes with long-term implications. A second pathway, a behavioural pathway, suggests that behaviours that support health (for example, adequate exercise and sleep) as well as those that undermine health (over-consumption of alcohol, poor diet, substance misuse) are more likely to emerge and be maintained during times of stress and trauma.

2.4.1 Physiological Pathway

We turn first to the physiological responses to stress and trauma. Physiological arousal in response to short-term (acute) stress is generally indicated by increased blood pressure, cardiac output and alterations in cortisol levels (Heinrichs et al., 2003). In laboratory settings, it is reasonably easy to stress people with simple cognitive or social stressors and observe their blood pressure and heart rate increase in response to these stressors. These can be considered short-term responses to stress and are most often driven by adrenaline. Adrenaline also gives rise to increased cortisol production. Cortisol functions to convert energy stored in the body into glucose so that it is ready for use by the body. This facilitates access to energy resources to sustain the increased requirements of our increased heart rate and blood pressure during times of stress. Indeed, these physiological responses to stress are necessary for our bodies to cope with stress. This pattern of arousal can be considered preparation for 'fight or flight' as it were. When these responses to stress are large or long-lasting, we see negative effects on our health (Lovallo, 2015).

Indeed, physiological responses to stress have been an area of serious research effort over the last forty years. It has given rise to a very influential idea in health psychology: the cardiovascular reactivity hypothesis (Obrist, 2012). Cardiovascular reactivity (CVR) measures the physiological changes, from baseline, in response to a stressor. Research shows that exaggerated or prolonged cardiovascular (i.e., blood pressure and heart rate) responses to stress are associated with increased risk of cardiovascular disease (CVD) development (Chida &

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Steptoe, 2009). Generally, the more prominent and intense a stimulus or stressor is, the greater the disease risk. Cardiovascular reactivity offers a way of understanding how acute stress might affect our physical health.

The cumulative burden of repeated or chronic stress and the associated cost of cardiovascular reactivity in response to chronic stress is an important consideration. People and groups exposed to repeated trauma experience longer-term or sustained physiological responses (Gallagher et al., 2021). Allostatic load is a useful concept representing the cumulative burden of chronic stress on the body's multiple physiological systems (e.g., metabolic, immune and endocrine) as people attempt to adapt to life's many demands (McEwen and Stellar, 1993). Allostatic load has been shown to be associated with CVD morbidity and mortality (Rumsfeld et al., 1999; Zhang et al., 2010). This cumulative burden of stress and trauma is profoundly linked to later health outcomes.

Whilst much research has found that individuals who display exaggerated responses to acute psychological stress are at a greater risk of future hypertension, atherosclerosis and cardiovascular mortality (Carroll et al., 2012; Gerin et al., 2000), a failure to mount a sufficient response is also related to poorer health (Keogh et al., 2022; Phillips et al., 2013). These types of responses are sometimes called 'blunted'. The idea of a blunted response is in line with allostatic load theory, which highlights that ongoing stress and trauma leads to 'wear and tear' on the body (Glei et al., 2007; Guidi et al., 2021). Effectively, chronic stress and trauma reduce our ability to mount an adequate response in the face of ongoing stress. In our own research we have found that childhood trauma is linked to blunted reactivity, and this was most apparent in people with less social integration (McMahon et al., 2022). Blunted cardiac reactivity is also related to increased depressive symptoms, addiction, obesity and poorer self-reported health and well-being (Keogh et al., 2023; Phillips, 2011).

The physiological responses to stress and trauma do not just alter cardiac responses, however. Neuroendocrine reactivity, and in particular cortisol in response to stress, is a second key mechanism. Exaggerated neuroendocrine responses occur in situations of chronic or extreme stress, which can increase disease risk and also impact cognitive functioning. Cortisol acts as a biological intermediary between trauma and health (Cohen et al., 1997). Increased cortisol

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activity is displayed in response to laboratory stress and daily life stress (Gallagher et al., 2016; Keitel et al., 2011) and in response to trauma such as child abuse (Chavustra & Cloitre, 2008). Cortisol, as well as making energy available during times of stress, has an immune-suppressing effect. So, though cortisol can be important in facilitating increased energy demands, over time increased cortisol interferes with the body's immune function and our ability to fight disease (Irwin, 2008; Segerstrom and Miller, 2004).

This alteration of immune function has serious implications for people's health over the short and long term. Originally, Janice Kiecolt-Glaser and Ronald Glaser (1992) set out to consider the impact of spousal bereavement on immune function. They had noted the tendency, as was the case for my own parents, for cohabiting spouses to die within a year of each other. Their work led to the development of a field known as psychoneuroimmunology. Amongst other developments, this field has now identified links between the psychological and physiological features of cancer risk. The persistent activation of the hypothalamic-pituitary-adrenal axis during chronic stress is believed to impair immune response and contribute to the development and progression of cancer. Molecular immunological factors during the consecutive stages of the multistep immune reactions have been shown to depend on the type, chronicity and intensity of the stressor (Reiche et al., 2004). Altered immune function is similarly linked to the maintenance and progression of other diseases. For example, in the short term, antibody responses to vaccination are poorer in those with greater experience of stress and trauma (Burns et al., 2003; Burns and Gallagher, 2010; Pedersen et al., 2009; Phillips, 2011; Whittaker, 2018). Again, this evidence is consistent with the idea that stress and trauma are a type of wear and tear on the body, and over time this (allostatic) load alters people's functional adaption to stress.

2.4.2 The Behavioural Pathway

Any physiological effects of traumatic experience on health are likely amplified by the behavioural pathway that links stress, trauma and health. Behaviours that are linked to health are known as health behaviours. For the most part, this crucial role of behaviour in shaping morbidity and mortality has become widely accepted across medicine and epidemiology over the last three decades. Behavioural

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immunogens are behaviours that support health such as having a balanced diet, exercising regularly and practicing safe sex. Behavioural pathogens are behaviours that damage health such as smoking, substance misuse or poor sleep patterns. Stress and trauma appear to alter both habitual (i.e., regular, day-to-day) and non-habitual health behaviours (Sergestron & O'Connor, 2012).

The idea that stress is linked to health behaviours is a popular one. A quick click on the internet displays plenty of information on the adverse effects of stress for overeating, smoking, and alcohol consumption. And science generally backs up the popular notion that stress can change health behaviours. Stress is associated with higher fat diets (Laitinen et al., 2002; Ng & Jeffery, 2003) and greater fast food consumption (Steptoe et al., 1998), higher levels of smoking and reduced probability of smoking cessation (Steptoe et al., 1996), increased alcohol consumption (Steptoe et al., 1998) and lower levels of physical activity (Kivelä et al., 1991; Ng & Jeffery, 2003; Steptoe et al., 1998).

Health behaviours are also strongly intertwined with mental health (Parletta et al., 2016). Existing research testifies to the reciprocal nature of interactions between physical well-being, chronic disease and mortality. However, it is also becoming clear that health behaviours have an impact on mental health. For example, in one important study, the people adopting no healthy behaviours had 2.7 times more depressive symptoms compared with those adopting four healthy behaviours (Harrington et al., 2010). In another large-scale study, physical activity, alcohol consumption, smoking, body mass index and regularity of social interaction were all associated with specific mental health outcomes (i.e., depression, anxiety and stress) (Velten et al., 2014). Physical activity has been identified as an important protective factor in reducing the risk of developing depression (Mammen & Faulkner, 2013). So, my engagement with running as an important way to manage my mental health is nicely backed up by science.

While numerous studies consider the relationship between stress and specific health behaviours, much of this research is based on clinical samples or conducted in laboratory settings that rely on simulated stressors (Umberson et al., 2008). Community samples can link naturally occurring stressors and health behaviours in the general population. For the most part, these are cross-sectional studies rather than longitudinal ones. They offer a snapshot of the relationship between

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stress and health at one point in time. Studies of this nature present the perennial 'chicken and egg' question: Which came first? Does stress cause poor health behaviour, or poor health behaviour cause stress? Longitudinal research is needed to establish the direction of the relationship between severe trauma and stress and health behaviour over a person's lifetime. For now, available evidence seems to suggest that chronic stress and the disadvantages that co-exist with traumatic experiences tend to make the establishment of predictable and healthy lifestyle practices difficult. Indeed, disadvantaged circumstances would appear to be a type of stress in and of itself (Ryan et al., 2021; Ryan et al., 2022).

2.4.3 Personal Pathways to Health?

So, if I return to the idea that my own life has been charmed, certainly it would seem that although I have a relatively sedentary job, the predictability of the hours that I work has allowed me to develop healthy habits. Cortisol tends to peak in the morning, so running before a day's work puts this waking cortisol to good use. It also leaves me with a small sense of accomplishment as I face the day. Of course, running five kilometres before a day's work might be a very different proposition were I about to face a day's work on my feet, a prospect often associated with low-paid work. Nor would it be possible to leave my children home alone early in the morning to run were I a single mother. Engagement in regular exercise also requires time, something that is often in short supply for those caring for children, elders or disabled relatives. Unsurprisingly, there have been times in my life when I have struggled to find that time – when my parents were ill, when my husband was ill, when my children were ill. So, though exercise is often presented as an activity we 'choose', in reality, regular running or a pastime of any sort is much more of a luxury than a 'choice'. And it is when we need to be maintaining our destressing habits most that we tend to have the least capacity to engage. In this way we can see that whilst individual action is relevant to health behaviour, it is simplistic to think that people's health behaviour is all about healthy choices. Social, cultural and political factors shape both stress and health behaviours.

Strong assumptions about the role of individual factors in shaping health behaviour are evident across the literature in health psychology

https://doi.org/10.1017/9781009306997.003 Published online by Cambridge University Press

and epidemiology (Muldoon, Liu & McHugh, 2021). This can lead to scenarios where those affected by both health issues are seen as 'deserving' of their ill-health, or culpable as it were. By doing this, we erase the barriers that prevent people from engaging in healthy behaviours. To enact any health behaviour you must be both willing and able. You have to want to run and be able to run. You have to want to get vaccinated and also have access to a vaccine. But I might not feel safe enough to run if I am routinely harassed on the street. I might not be willing to get vaccinated if I have reason to mistrust the government or big pharma. Capacity to act is profoundly related to opportunity, (dis) ability and available resources. Maybe I have no time to run, or have a disability, or simply no shoes to run in. Maybe I can't get vaccinated due to work rules that do not permit time off for health care, or I have an underlying health condition, or there are no vaccines available where I live. Because we assume people's health is driven by choice, we are willing to judge and even vilify those who don't exercise, drink too much or don't get vaccinated. Sometimes we even damn ourselves for not doing these things. In so doing we obscure the role of social and political forces that drive trauma, health behaviour and disease risk.

This has two important implications for longer-term health. First, traumatic experience and chronic adversity affect people's lives in ways that affect their ability to access health and social care as well as changing their social and health care usage. Trauma-informed care aims to support engagement with public health and treatment to maximise health outcomes for vulnerable populations and, in particular, those who have lived with chronic stress. This includes offering advice about adherence or health practices that is viable for people. Advice needs to be tailored for each person's situation. Post-traumatic stress in marginalised and stigmatised groups can be misinterpreted as aggression and hostility, limiting access to services further. So, the potential for misunderstanding is high. However, there remains a duty of care to those with ostensibly self-destructive behaviours in universal health and social care systems. And it is always worth remembering that people sometimes have a good reason for limited trust in statutory services.

The second implication of this approach is the realisation that destructive lifestyles, rather than being a product of poor choices, can be habitual practices borne of chronic stress and trauma. In many regards, debates about the root cause of ill-health, and whether it is as a result of poor lifestyle choices or adverse life circumstances, go to

https://doi.org/10.1017/9781009306997.003 Published online by Cambridge University Press

the heart of an important methodological issue. This methodological concern – whether trauma and adversity cause poor mental health and lifestyle practices or whether poor mental health and lifestyle practices cause adversity – is often seen as a highly politicised question. In reality, this is fundamentally a political psychological question: at its heart it asks who is, and isn't, deserving of care and concern.

2.5 Trauma Has Social Costs

As well as the personal health costs of traumatic experience, we think of trauma as having wider social costs. Traumatic experience can have impact on people's social behaviour rather than just their health behaviour or their physiology. A distinct focus of much of this research has been on children and adolescents, and there remains a view that traumatic experience in early life can have a particularly powerful influence on social and political attitudes. So, for example, the experience of political violence has been related to aggressive and delinquent behaviour. An increase in juvenile crime during wartime was first documented in World War I (Leeson, 1917), and a similar increase was seen again in World War II (Titmus, 1950). This has been variously attributed to excitement attached to the notion of conflict, decreased parental supervision during times of violence and extreme stress, and normalisation of violence and social modelling as a result of the conflict (Muldoon & Cairns, 1999).

Research evidence has followed the early war observations of children using standardised indices of juvenile crime (Pfeiffer, 1998) as well as psychometric measures such as indices of externalising behaviour problems (Fee, 1980). Children who grow up in families affected by domestic violence also face challenges as a consequence of this highly traumatic early experience in their later lives (Naughton et al 2020). Those who grow up in homes affected by abuse tend to be at higher risk of becoming both victims and perpetrators of domestic violence themselves. And children and young people whose parents die by suicide are similarly at greater risk of suicide themselves (Soole et al., 2015). There is a tendency for young people to view the behaviours as acceptable and typical where others, including parents or peers, have behaved in the same way. This is sometimes referred to as social contagion of risk: risk behaviours spread through social networks as they become normalised (Christaki & Fowler, 2013).

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These types of effects can also be attributed to the difficulty young people have in interpreting complex behaviour in traumatic situations. Clear conflict between what is said and what is done at times of trauma creates issues for exposed children. Take, for example, a child who is abused in their own home. Though they are blameless, it is often the case that they are removed from their home. Children can experience this as a form of punishment and can misunderstand their role in the abuse. Ambivalence around political violence is also common. In my own research we have seen how parents are often keen to keep their child removed from the risks of street violence or conflict in Northern Ireland and Nepal (Acharya & Muldoon, 2017; Muldoon, 2004). And though parents may work hard to protect their own children from the risk of violence, the conversations at home may routinely highlight the inequities and injustice of the political situation. On the one hand, then, parents are schooling their children to avoid danger, but, on the other hand, they may support and even celebrate the hostile actions of an aggressor on their own side. This type of position encourages a moral relativism that can leave young people with questions about the acceptability of violence as a solution for problems in public and private spheres (Muldoon, 2013).

In our own research we have shown how this type of gap can open up in responses to domestic violence. Domestic violence can be very difficult for young people to make sense of, and young people who grew up in homes affected by domestic violence show clear ambivalence about labelling their family situation (Naughton et al., 2019). Even young people who self identify as having grown up in homes affected by domestic violence and abuse struggle with labelling their experience as domestic violence. Similarly, we found ambivalence in the narratives of family court judges managing domestic violence cases. Even experienced judges seemed to want to maintain a narrative and an appearance of a normal family life for affected families, rather than acknowledging the very real trauma exposure that children had suffered (Naughton et al., 2015).

For those who experience stigmatising trauma, the world is equally as harsh. Stigmatising traumas such as domestic violence, bereavement by suicide, and rape and sexual assault place those affected on the margins of society. People's ability to engage with others in their existing social networks is diminished (Muldoon, Haslam et al., 2019; Naughton et al., 2015). And the legitimacy of victims'

https://doi.org/10.1017/9781009306997.003 Published online by Cambridge University Press

complaints about their situation is undermined (Bradshaw & Muldoon, 2020). As a result, those affected by stigmatised traumatic experiences either can find themselves removed from sources of social support or, worse, feel that their 'transgression' justifies their suffering (Bradshaw & Muldoon, 2020). Where this is the case, it is likely to impact profoundly and negatively on health (Stevenson et al., 2014).

Those affected by stigmatised trauma are constructed by others, then, as something other than innocent victims. Victim blaming can quickly ensue. This undermines the degree of social connectedness and solidarity among different community groups within a society, something that is often referred to as social cohesion. Social cohesion affects levels of trust and connectedness between individuals and across community groups (Fonseca et al., 2019; Ludin et al., 2019). Higher social cohesion and trust in others has been associated with better health outcomes for all (Chuang et al., 2013; Feng et al., 2016; Miller et al., 2004). Stigmatising a traumatic experience, then, has a social cost. It maintains and enhances social divisions within society.

In essence, for children and young people who encounter grievous and daily human rights violations, insisting on 'moral behaviour' can be interpreted as meaningless rhetoric. A study exploring how living in war-affected Colombia had impacted the views of the children and adolescents (Posada & Wainryb, 2008) speaks clearly to this issue. Young people were asked questions about justice and welfare. They clearly judged it wrong to steal or hurt others. On the other hand, judgments with regard to revenge were more mixed. Their more ambivalent attitude to revenge was underpinned by a majority belief about the nature of the world. They thought that others would steal and hurt them in most situations. In effect, the difficult contexts within which children grow up, as well as their actual exposure to violence, had profound consequences on children's developing understanding of how the world works. Where those tasked with upholding the rights of children and their families fail, trust in others is lost. The world of children who have been traumatised, disempowered and poor is a harsh world.

Insisting on a need for young people's behaviour to be moral in these contexts is likely to add insult to injury. There is no doubt that this can be a cause of anger. In situations where young people witness human rights violations and a failure by a 'moral majority' to intervene or protect vulnerable family and community members, young people can

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feel both compelled and justified to respond (Bar-Tal et al., 2017). These responses may seem questionable to others. In more peaceful countries, it can result in active engagement in protests. In situations where there is long-standing division and hostility, it can easily overflow into street violence and riots (Barber, 2013; Muldoon & Wilson, 2001). These hostile engagements, as well as delivering further traumatic experiences, reduce social cohesion. Those who participate in protests can come into contact with state actors. Where hostile interactions ensue, protesters lose trust in the institutions such as the police. This state system then comes to be seen as one that serves and protects the more privileged and powerful in society. As well as corroding trust of those angry and protesting, this can leave the majority, the mainstream, feeling attacked and undermined (Bar-Tal & Cehajic-Clancy, 2014).

This lack of trust in one state service, the police or army, often translates into lack of trust in other institutions such as welfare and health systems (Khatib et al., 2022; McWilliams, 1997). This can translate into other socially corrosive practices. This is in part due to the fact that those who display anger or hostility in response to trauma are not seen as deserving of our care. Traumatised children if presented as passive victims are seen as deserving of our concern (Muldoon & Cairns, 1999). This is increasingly unlikely to be our view as these children become adolescents and adults. They morph all too quickly in the public imagination into undeserving, and even dangerous adolescents or youths (Muldoon, Trew & Kilpatrick, 2000). Being proactive, and no longer conforming to our stereotype of victimhood, older children and adolescents are less likely to be seen as deserving of care or concern. Often, we emphasise particular characteristics of those who become violent. Even though perpetrators are typically young and male, their violent actions are interpreted and reported in the media with regard to race and/or ethnicity. This type of practice is destructive. It stereotypes the protagonists as 'mad' or 'bad' (Muldoon, McLaughlin et al., 2008). It stereotypes the ethnic group to which they belong as aggressive and dangerous. It erases the societal practices and structural forces that fomented a sense of anger and injustice. This results in further divergence of those who do or do not trust the state, news media and public institutions. Trauma is both self-perpetuating and fundamentally corrosive.

Awareness of this phenomenon has given rise to an area of research known as collective trauma. Collective trauma research highlights the

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changes in the social fabric of society associated with trauma. This work is less concerned with the personal, medical or clinical consequences of trauma felt by those directly exposed. Rather, this research highlights the ripple effects of trauma across a society. Though collective trauma can bring distress and negative consequences to individuals, the key focus is on the change it brings to the entire fabric of a community (Erikson, 1976). For example, the scale and global nature of the COVID-19 emergency means that the crisis is a collective trauma. And as such, many people will have a sense that they share the experience of this major upheaval with others. However, as the pandemic unfolded and affected many people around the world, it has become clear that the scale and intensity of this upheaval differed widely between countries and even within the same country. For the most part, the threat of the pandemic was dealt with collectively at a national level, and to some degree the WHO has attempted to coordinate a global response. As would be expected when a collective trauma is experienced, this has impacted relationships, changed social norms and altered policies and governmental processes, and the way society functions (Chang, 2007; Hirschberger, 2018; Muldoon, Lowe et al., 2021; Saul, 2013). And it is likely that more social and political ramifications of the COVID-19 pandemic are yet to come.

2.6 Economic Costs of Trauma

Trauma also has an economic price. This price can be felt at an individual level and a country level as well as impacting affected social groups. We can see that very clearly with regard to the COVID-19 pandemic and the rising inequality that has been associated with the crisis. Estimates are that the global response so far has costed $11 trillion, with a future loss of $10 trillion in earnings (World Economic Forum, 2020). War and gender-based violence are also extremely costly. Research indicates that the cost of violence against women amounts to around 2 per cent of global gross domestic product (GDP) (Garcia-Moreno et al., 2015). This is equivalent to $1.5 trillion, which approximates to the size of the Canadian economy (United Nations, 2013). In some countries, violence against women is costing up to 3.7 per cent of their GDP – more than double what most governments spend on education. Failure to address political and gender-based violence also entails a significant cost for the future.

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And in the same vein we now know that those countries that failed to address the COVID-19 pandemic adequately are those that paid the highest price as the crisis continued (Muldoon, Liu & McHugh, 2021).

A diagnosis of PTSD is also associated with a significant economic burden. The nature and extent of post-traumatic stress have been examined in the WMH surveys. These surveys estimate the lifetime prevalence of PTSD using representative samples in twenty-seven countries. They use a metric known as 'the burden of a disease'. The burden of a disease can be thought of as the years of life lost due to death and disability from any given disorder (Murray & Lopez, 2013). Because we have data on PTSD from around the world from these WMH surveys, we can measure the burden of PTSD worldwide. This burden measure represents both the prevalence of trauma and the persistence of symptoms people experience. It is estimated that, globally, PTSD is the cause of 0.4 per cent of disability from all physical and mental health causes. This is equivalent to the disability cost of schizophrenia, the mental health condition often considered to have the most severe health toll (Ayuso-Mateos, 2002; Kessler et al., 2009).

As such, trauma and PTS are major mental health concerns that come with not only a psychological cost but a significant social and economic cost at the individual and the population level. And this cost is growing. The estimated cost of PTS in the United States for 2018, the latest year for which data were available at the time of the study, was $232.2 billion (Davis et al., 2022). The economic burden of PTS goes well beyond the individual economic burden of health felt by individuals or the associated direct health care expenses. It also exceeds the costs of other common mental health conditions, such as anxiety and depression. Increasingly, the economic burden of PTS costs is experienced by civilians. In the United States, 82 per cent of the economic burden associated with PTSD was seen in civilians compared with 18 per cent in the military population in 2018 (Davies et al., 2022). This increased civilian burden of PTS is reflective of the increasing exposure of civilian populations to traumatic events, including COVID-19, civil unrest and climate change.

Findings also highlight that trauma can amplify pre-existing inequality. Recall that the experience of trauma is more likely to be felt by those in socioeconomically disadvantaged circumstances. Traumatic experiences exacerbate the economic challenges experienced by those already disadvantaged. For example, intimate partner violence has a lifetime

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economic cost, and that economic burden is higher for women who experience domestic violence than men who have domestic violence experience (von der Warth et al., 2020). In the United States, current estimates are that the economic cost of experiencing intimate partner violence for women across their life span was $103,767. While there is a cost for men who are victims of domestic violence, this is much lower, at a $23,414 lifetime cost. In this way we can see how this type of trauma amplifies income inequality experienced by men and women.

War and political violence can also be seen to amplify global inequality. One way in which this can be illustrated is by comparing the average economic cost of violence in the ten most conflict-affected countries in the world with the cost of violence in the ten most peaceful countries in the world. The countries most affected by violence spend on average 41 per cent of their GDP managing the economic costs of this violence. In stark comparison, the average economic cost of violence in the ten most peaceful countries amounts to just 3.9 per cent of their GDP. In this way we can see that the burden of violence diverts a country's economic resources into managing the fallout of violence. In contrast, more peaceful countries have more resources available for development of national infrastructure (Dunne, 2017). In this way, we can see how the economic burden of conflict also feeds inequality between nations. These effects mean that people most affected by trauma, whether gender-based violence, war and political conflict or COVID-19, are those least likely to have economic resources available to deal with the fallout of traumatic experiences.

Globally, trauma is the sixth leading cause of death. In both men and women, one in every ten deaths is a result of trauma such as violence or car accidents. In those under thirty-five years of age, trauma is the single largest cause of death and disability. Globally across all ages, trauma is the fifth-ranking cause of moderate and severe disability (Murray et al., 2012). Some of the economic cost of trauma arises from its impact on death and disability. Those affected by trauma often live with long-term disabilities. For instance, one study of US Vietnam veterans estimated that almost 70 per cent had war-related disabilities more than forty years after their war experiences. These included eye and ear disorders (47% of cases), musculoskeletal disorder (18% of cases) as well as mental health conditions (47% of cases) such as PTSD (Clarke et al., 2015). And again, reflecting pre-existing disadvantage, people with disabilities are at heightened risk of further trauma during conflicts and humanitarian crises.

https://doi.org/10.1017/9781009306997.003 Published online by Cambridge University Press

2.7 Conclusion

Peace is a complex and, at times, elusive construct (Davenport et al., 2018). Its most prominent definitions are the absence of direct violence and the presence of social justice and equality (Galtung, 1996). This absence is often referred to as negative peace, referring to the lack of conflict despite the ongoing presence of strained relations. Positive peace, in contrast, is derived from social cohesion and sustainability and positive social attitudes, as well as institutions and structures that create and sustain peace (Fry et al., 2021). Positive peace is sustained by high levels of human capital, acceptance of the rights of others, good relations within and between countries and free flow of information and equality (Fry et al., 2021). The UN included in its 2015 sustainable development agenda goal 16: promoting justice, peace and inclusive society (Envision 2030).

Peace, by definition, is essential to public health and prevention of death, disease and disability. At the individual level, being able to access care and enact behaviours in support of health when you are negotiating traumatic experiences is crucial. These resources are both tangible and intangible. In my case my negotiation of difficult experiences was facilitated by the fact that I live in a country where I could access tangible supports such as a family doctor, a counsellor and prescription medication. A second factor is that I have always lived, by virtue of my educational privilege, in university areas during my adult life. These areas tend to be relatively safe for women to exercise outdoors. Running has been a viable way to manage my distress because of the relative safety and acceptability of this exercise practice for women in Ireland. Positive peace in the form of a healthy and safe physical and sociocultural environment can be seen to be relevant to my charmed existence. My individual success at negotiating the curve balls life has thrown is due to a large degree to the fact that my basic needs were met because of the availability of social and public resources such as health care. On the other hand, nations without positive peace are disproportionately affected by trauma. And traumatic experiences contribute to further poverty, disability, underemployment, forced migration of populations, family separation and homelessness, all of which carry significant social and economic costs. And these traumatic experiences are directly relevant to the ability of individuals and communities to build their future.

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