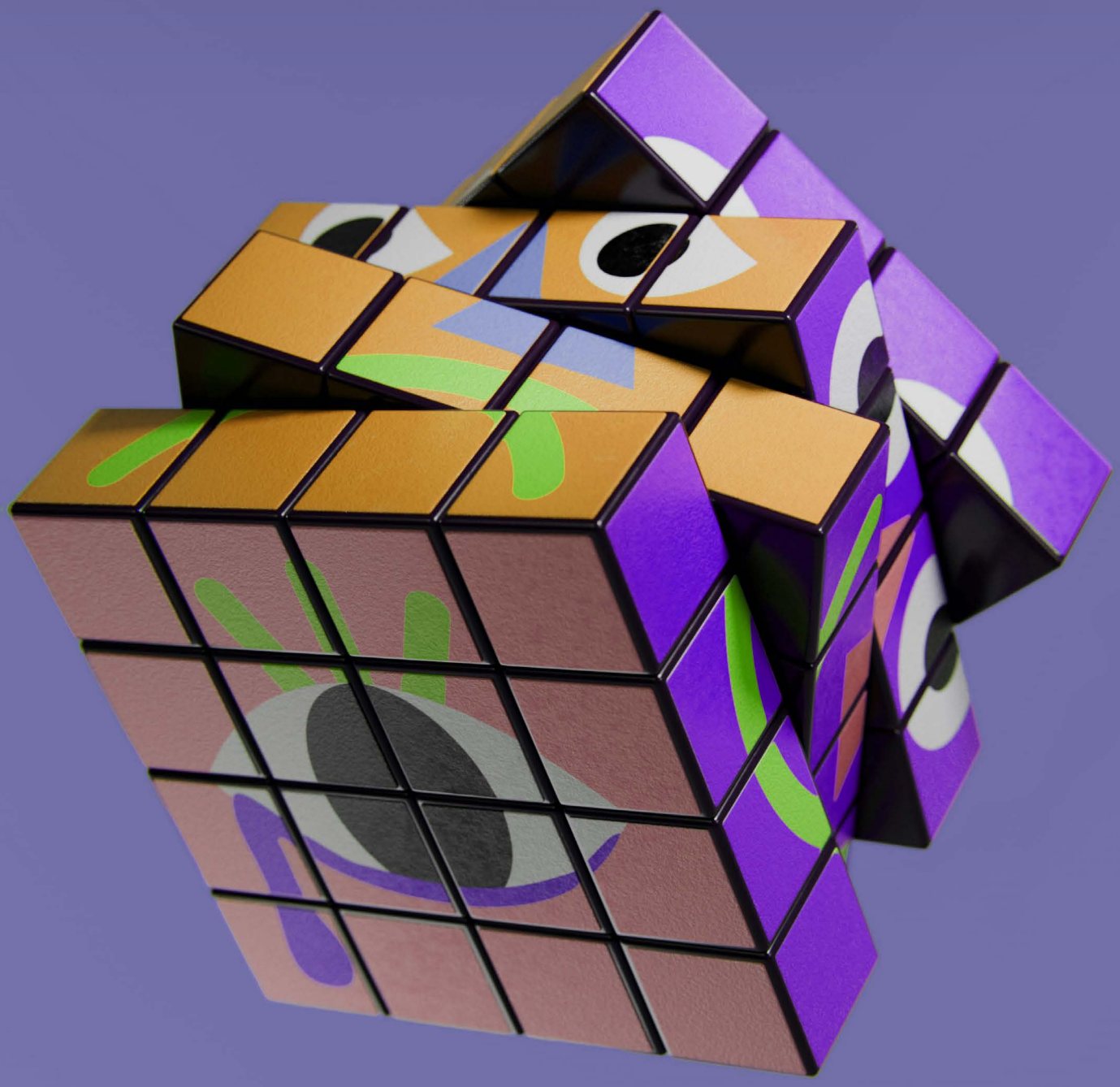
Institute and Faculty of Actuaries

Examining the impact of today's challenges on longevity

July 2024

Longevity Bulletin

Issue 16: The mental health issue



ISSN 2397-7213

Contents

Introduction by the Editor

We all became used to (and probably weary of) the term 'exponential growth' during the pandemic, words that enjoyed their own exponential growth for a time. Another word that has recently mushroomed in usage, in particular in epidemiological contexts, is 'multifaceted' – 'having many different aspects to be considered'. According to Google Trends, incidence of it in the public domain has increased by a factor of around five over the last ten years.

While I find the word's proliferation irritating, to the extent that its inclusion now seems obligatory in research papers while adding little, there are areas where it fits well. One field where the term might be regarded as essential is the field of mental health. If the brain is an order of magnitude more complex than, for instance, the heart, so might we expect mental health to be an equivalently more complex field. From my lay perspective, there seems to have been a rapid increase in recent years in appreciation of the 'multifaceted' nature of mental health: something that now extends well beyond the physiological and biochemical aspects of the brain to include an incredibly broad range of influences.

This edition of the *Longevity Bulletin* considers some of those wider aspects. The most striking new 'facet' to me is the importance of nutrition. We learn in John Schoonbee's revelatory article how ketogenic (low carbohydrate) diets can, through their effect on the body's metabolism, help to improve mental health problems.

Moving beyond the physiological into wider areas, we see in Lisa Balboa's leading article (written in her capacity as co-chair of the IFoA Mental Health Working Party) how digital technology can help individuals, and hence also insurers, manage mental health. Peter Hovard considers how behavioural science can help manage disability and income protection claims through more attentive wording in policyholder communications.

From a wider societal perspective, Chris Martin outlines how the pandemic through its direct and indirect impacts seems to have worsened mental health. This article includes consideration of mental health problems in health care workers, and this theme is looked at further by Stuart McDonald, Florence Ma and Lydia Dutton through the perspective of the NHS's most recent survey on its workforce and the problem of burnout.

It is certainly a field meriting the term 'multifaceted'!

Finally, the production of the *Longevity Bulletin* is not something we should take for granted, and its quality derives from the time, effort and expertise of our contributors, together with equivalent dedication from the editorial team. It has been a great privilege and indeed a labour of love to have served as editor for several years, and I take great pleasure in handing the editorship on to Michael Anderson, who has been assisting as deputy editor for some time now. Thank you.

Matthew Edwards
Editor

Foreword by the President of the IFoA

The Institute and Faculty of Actuaries has been increasingly active in the field of mental health, and it is great to see this activity reflected in this dedicated edition of the *Longevity Bulletin*.

Actuaries have an enormous amount to contribute in this field, given our key skills around risk identification and quantification, data analysis, and our close involvement with life and health insurance providers. But moving beyond insurers and reinsurers, we have a wider societal commitment to the public good, and the actuarial profession can also help in that wider remit.

I would like to draw attention particularly to the work of the Mental Health Working Party, led by Lisa Balboa and Joe Wilson. This Working Party has been busy in a number of important ways, including input to the actuarial syllabus (the Healthcare and Life specialist subjects), raising awareness through podcasts and blogs, data and modelling considerations, and facilitating cross-industry conversations about mental health in an insurance context.

It is not just the IFoA that has been working in this area, of course. The subject is so important that many of our counterparts have also been active, particularly the Australian Actuaries Institute in Australia and, in the US, the American Academy of Actuaries and the Society of Actuaries.

Mental health issues affect us all to varying degrees, whether directly or indirectly, and there is increasing awareness of the link between longevity and mental health. While actuaries are well able to distinguish here between correlation and causation, and much of the linkage is likely to be correlation, not causation, we can also appreciate the importance of healthy life expectancy. Leonardo da Vinci famously said, 'Life well spent is long', and as actuaries we would like to help people live their lives 'mentally well' – as well as long in the typical actuarial sense!

My thanks to the authors who have contributed their time and expertise to this edition of the *Longevity Bulletin*, and to the editorial team.

Kalpana Shah
President, Institute and Faculty of Actuaries

Mental health: digital opportunities

Lisa Balboa, Co-chair, IFoA Mental Health Working Party

There has been substantial recent growth in opportunities to utilise digital tools and technologies for supporting mental health. These range from the use of daily tools for well-being and preventative health care through to their clinical use in treatment of various mental illnesses. There are a wide variety of digital tools being used in the mental health area, including mobile apps, wearables, video consultations and even virtual reality.

Regulation and best practices across countries are supporting the growing use of digital in prevention, treatment and management of mental health (NHS Confederation, 2021–4). For example, Germany's Digital Healthcare Act, which came into force in December 2019, provides a formal process for digital health care apps to be prescribed as a treatment to patients by medical professionals (Federal Ministry of Health, 2020). Another example is the Organisation for the Review of Care and Health Apps (ORCHA) (**https://orchahealth.com/**), which operates in multiple countries, including the UK. It evaluates and reviews health and care apps, assessing areas including clinical standards and data security and privacy. ORCHA have already certified a wide range of mental health apps.

The combination of new regulations, best practices and technological advances is creating increasing opportunities for the use of digital in mental health across health systems, employers, and insurers. In this article, we will look at opportunities for digital for these three areas in turn.

Health systems

Mental ill-health is very prevalent. University of Queensland and Harvard Medical School (2023) estimate that globally, one out of every two people will develop a mental health disorder at some point in their lifetime. Digital tools could play a valuable role as part of national health care systems to meet growing demand for mental health care and there is increasing recognition of the role digital mental health tools may play. For example, in the UK, the 2023 Spring Budget announced significant investment in digital health innovations for the management of mental health (Barron, 2023; HM Treasury, 2023). Opportunities for digital in mental health services in England span prevention, such as providing wellness apps, through to treatment, including clinical grade apps and the use of digital therapies.

The use of apps and video consultations can help scalability in the prevention and management of eligible mental health conditions. This can help to address regional health inequalities. For example, in 2021/2, waiting times for NHS Talking Therapies in England showed large regional variations, ranging from four days up to 229 days (UK Parliament, 2024). Efforts to digitise the NHS Talking Therapies programme in England were included as part of the 2023 Spring Budget's announcement about investing in digital health innovations, which can thereby help reduce disparities in waiting times across regions (Barron, 2023). At an IFoA webinar in 2024, Dialogue demonstrated the value of digital mental health tools in insurance (IFoA, 2024).

Dialogue found that their digital Cognitive Behavioural Therapy (dCBT) had diverted 27% of individuals away from traditional mental health support to digital support, with comparable outcomes.

The main role of digital is to supplement and augment, rather than replace, traditional modes of care. Certain groups, such as some older people or some people in lower socio-economic groups, may have more limited access to digital technologies. It is therefore important to guard against inequalities in care when digital tools are adopted into public health approaches and clinical practice.

Employers

Mental health is a leading cause of long-term sickness absence in the workforce. The Times Health Commission survey of businesses found an increase in employees taking long-term sick leave due to mental ill-health (Sylvester et al., 2023). In the UK, Deloitte (2024) estimate the cost of mental ill-health to employers is £51 billion per year. Trautmann et al. (2016) estimated that the annual global direct and indirect economic costs of mental ill-health at US$2.5 trillion. Employers therefore have an incentive to invest in supporting the mental health of their workforce to reduce costs from sickness absence. In addition, protecting the mental health of employees and promoting well-being can also lead to an increase in productivity (CIPD, 2023)

Digital mental health tools and services are increasingly being incorporated into employee benefits packages and group insurance coverages. One example is the role of digital in offering a stepped-care or matched-care approach to cater for a wide range of differing mental health needs among employees. This approach allows mental health and well-being support that is matched to an individual's level of need, either to increase levels of care for more severe mental health needs or to lower levels of care when needs are less severe. In-app digital mental health assessments can help to triage individuals to the appropriate levels of support.

For severe needs, they may be referred to services such as a teleconsultation, internet-based Cognitive Behavioural Therapy (iCBT) or an in-person medical appointment. For less severe needs, on-demand chat with a coach may be recommended. For others, self-serve digital resources to support them in areas such as stress management and sleep may be well matched to their level of need.

One practical example of the employer sickness absence savings that can be achieved through digital mental health support is the Thrive Mental Well-being app (**https://thrive.uk.com/thrive-app**). The app proactively screens and triages mental health by adopting the PHQ/GAD screening measures that are commonly used to assess the clinical severity of depression and anxiety. For employees with a moderate or above score on these mental health assessments, Thrive therapists reach out via the app to schedule a Triage assessment. Employees are then guided to an appropriate care pathway, including self-management, guided self-help, or structured therapy (via text chat or video). In a case study on the use of the app by Staffordshire Police, Thrive found a sickness absence and employee retention benefit of more than £600,000. This illustrates how digital mental health apps can be used to not only provide critical support services for employees, but also to help employers through lower sickness absence costs.

Many leading providers of these services also offer employers aggregated data analytics insights into general trends regarding workforce use of such services. Data privacy and confidentiality of individuals is protected, but these general insights can help employers do more to promote use and refine their employee benefits offerings to match workforce needs.

Insurance

There is also a wide range of opportunities to integrate digital mental health tools into insurance.

- **Life and Health insurers**

  For life and health insurers looking to offer additional services to customers, digital well-being tools can be complementary for products, including health insurance, life insurance, critical illness insurance and income protection insurance. There are clear relationships between physical health, mental health and financial health. This makes digital well-being tools relevant for insurers in supporting the mental health and well-being of customers. There are examples of digital apps being offered by insurers to promote holistic well-being, including Thrive, Headspace and Dialogue among many others. Many of these incorporate physical activity, diet and nutritional advice, mindfulness activities and financial planning support. Some of these use gamification-type approaches to encourage and incentivise customer engagement and use.

  These digital well-being support services can encourage better persistency rates through enabling insurers to build an ongoing connection with their customers. From the actuarial point of view, digital tools have the potential to reduce morbidity/mortality through promoting health and well-being. Insurers should aim to build up longitudinal data in this area to track the impact of digital well-being support services in terms of morbidity and mortality improvements that may emerge over time. This can help to ensure an evidence-based approach for investing in these tools, rather than relying on customer engagement as the main rationale and benefit for providing well-being tools.

  Positive self-selection is an important area to consider and adjust for when analysing the impact of digital mental health tools on claims ratios. People who proactively take steps to support their mental health may be more attracted to the insurance product/proposition that offers digital mental health tools. More granular analysis than simply looking at aggregate portfolio claim rates would be needed to adjust for this effect. Analysis would need to ensure that it is the engagement with the tool itself, rather than the positive selection effect, that is driving any visible improvement in morbidity/mortality experience between portfolios, either with or without digital well-being offerings.

- **Health insurance**

  For health insurance, offering digital mental health services can support an early intervention approach to mental health claims. For example, teleconsultations with mental health professionals could help to speed up access to mental health support, allowing people to seek treatment at an earlier stage. This approach may reduce overall claims costs by reducing the need for more cost-intensive mental health interventions, such as in-person consultations or inpatient admissions, that might have been necessary if access to mental health care had occurred at a later stage.

  An example of proactive prevention and intervention for mental health can be seen with the provider Headspace. Through their app they provide self-care through mindfulness and mediation, on-demand mental health coaching, remote and in-person therapy as well as remote psychiatry in the US. Headspace conducted an analysis in conjunction with Accorded, an actuarial analytics company, to estimate Headspace's impact on medical claims cost across approximately 1,600 members (Headspace, 2023). They found average savings of US$53 per member per month for people meaningfully engaged in the full end-to-end app and care model when compared to benchmarked costs matched on age, gender, co-morbidities and adjusted for geography. Even for those meaningfully engaging in coaching only, the savings were US$32 per member per month. The analysis also demonstrated lower spend for members with co-morbid conditions, including cancer, maternity, musculoskeletal and metabolic health. This example illustrates how cost savings from digital mental health approaches can help these solutions become self-financing or even create value for insurers.

  Building on this, the integration of digital mental health into health insurance should be done in a way that ensures relevant digital mental health tools are used appropriately to optimise the quality of care and to deliver value for both the insurer and the customer. To enable this, insurers can build up their data granularity and insights by enabling the claims journey to be tracked at a patient level. This data can then be used to analyse the value of offering telehealth services for mental health. This involves assessing the return on investment in terms of preventing more severe mental health claims and more intensive treatments among individuals who use the digital early intervention services compared to those who do not.

- **Income protection insurance**

  For income protection insurance (disability insurance), mental health is one of the main causes of claim. Using digital tools as part of prevention and early intervention could help to reduce the number of disability insurance claims for mental health. This can be beneficial to the insurer through a reduced claims ratio, to employers through reduced absenteeism, and to customers through reduced ill-health. Data on the impact of digital mental health tools on inception rates for disability insurance claims should be used to assess efficacy. Different types of digital mental health tools may have varying levels of effectiveness on population subgroups. A more granular analysis may therefore be helpful to encourage a more personalised/bespoke approach to the use of digital mental health tools for prevention and early intervention.

  From a rehabilitation perspective, certain types of digital mental health therapies and services as part of rehabilitation may also help to speed up a return to work. This could be offered during the deferred period on the policy (i.e., between date of first absence and date of first claim payment on the policy) to try to support claimants back to work before they enter the disability claim payment. They can also be used for policyholders in claim to support them in returning to work. In addition, they could also be relevant to continue to support policyholders who have recently returned to work, reducing the likelihood of relapse. Building up data to analyse the impact of digital mental health tools on disability claim inception rates, termination rates and relapse rates could be undertaken to help justify the business case for income protection insurers. This analysis can inform their investment decisions regarding funding for digital mental health therapies and services to support rehabilitation.

What's next?

There is widespread potential for digital mental health tools in proactively managing mental health and in treating mental ill-health. To unlock this potential, collaboration between a wide range of stakeholders will be important to help optimise the use of these tools across health systems, employment and insurance contexts. Clinical input will be needed together with best practices and regulations to ensure these tools are medically effective. When accumulating data and undertaking analysis to demonstrate the clinical efficacy and cost-effectiveness of investing in digital mental health provision, it is also important to ensure that robust data privacy and data protection processes are in place.

References

Barron, J. (2023). Spring Budget 2023: what you need to know. *NHS Confederation.* 15 March. **https://www.nhsconfed.org/publications/spring-budget-2023-what-you-need-know** [Accessed 20 May 2024.]

CIPD (2023). *Mental health in the workplace.* **https://www.cipd.org/uk/knowledge/factsheets/mental-health-factsheet/** [Accessed 20 May 2024.]

Deloitte (2024). *Mental health and employers: the case for employers to invest in supporting working parents and a mentally healthy workplace.* **https://www.deloitte.com/content/dam/assets-zone2/uk/en/docs/services/consulting/2024/deloitte-uk-mental-health-report-2024-final-new.pdf** [Accessed 20 May 2024.]

Federal Ministry of Health (2020). *Driving the digital transformation of Germany's healthcare system for the good of patients.* **https://www.bundesgesundheitsministerium.de/en/digital-healthcare-act** [Accessed 22 May 2024.]

Headspace (2023). *Moving the needle on mental health and cost savings: how one company improved employee mental health while saving money.* **https://get.headspace.com/outcomes** [Accessed 28 May 2024.]

HM Treasury (2023). *Spring Budget 2023.* 21 March. **https://www.gov.uk/government/publications/spring-budget-2023/spring-budget-2023-html** [Accessed 20 May 2024.]

Institute and Faculty of Actuaries (2024). *The value of digital mental health tools in insurance* (webinar). **https://actuaries.org.uk/learn/events/events-archive/2024/1/the-value-of-digital-mental-health-tools-in-insurance/** [Accessed 20 May 2024.]

NHS Confederation (2021–4). *Maximising the potential of digital in mental health.* **https://www.nhsconfed.org/publications/maximising-potential-digital-mental-health** [Accessed 30 May 2024.]

Sylvester, R., Lay, K. and Lambert, G. (2023). Poor mental health is main cause of long-term absence, say employers. *The Times*, 14 March. **https://www.thetimes.co.uk/article/mental-health-is-main-cause-of-long-term-absence-say-employers-times-health-commission-92dp0sfnq** [Accessed 20 May 2024.]

Trautmann, S., Rehm, J. and Wittchen, H. (2016). The economic costs of mental disorders: do our societies react appropriately to the burden of mental disorders? *EMBO Reports,* 17: 1245-9. **https://doi.org/10.15252/embr.201642951**

UK Parliament (2024). Mental health statistics: prevalence, services and funding in England. *House of Commons Library Research Briefing*. 1 March. **https://commonslibrary.parliament.uk/research-briefings/sn06988/** [Accessed 20 May 2024.]

University of Queensland and Harvard Medical School (2023). *Half the population to have a mental health disorder by 75*. **https://qbi.uq.edu.au/article/2023/07/half-population-have-mental-health-disorder-75** [Accessed 20 May 2024.]

Lisa Balboa

Lisa Balboa is Head of Hannover Re's Life & Health Digital Business Accelerator, co-ordinating Hannover Re's global innovation network dedicated to harnessing technological developments to unlock value across the L&H insurance ecosystem. She is a Fellow of the Institute and Faculty of Actuaries and is passionate about championing innovation in life and health insurance. Lisa is co-chair of the Institute and Faculty of Actuaries Mental Health Working Party, which aims to raise the level of understanding of mental health amongst actuaries and promote the consideration of mental health in the design of insurance products and processes.

Nutrition, mental health and income protection: a surprising connection

John Schoonbee, Group Chief Medical Officer at Swiss Re

Obesity and diabetes represent significant ill-health epidemics swamping the world's health services and playing a material role in slowing mortality improvements. Alongside these issues is a growing mental health crisis that we see in society as a whole and in the insured population.

Might there be a connection between obesity, diabetes, and mental health? If so, how are they connected? And most importantly, can something be done about it?

Metabolic health

Obesity and diabetes are parts of the overall concept of metabolic health. Good metabolic heath can be defined simply as having good metabolic markers. Arguably the most significant of these markers is our sensitivity to insulin.

First coined in 1988, the term 'Insulin Resistance Syndrome' (or 'Metabolic Syndrome') highlights a clustering of five conditions found in the presence of insulin resistance. These are:

1. Weight/body mass index (BMI)/abdominal obesity
2. High blood pressure
3. High triglycerides
4. Low high-density lipoprotein (HDL) levels
5. Glucose intolerance (pre-diabetes/diabetes).

Looking at this list, it is clear why many public bodies and charities working in the field of cardiovascular medicine have also taken notice and adopted the newly named Metabolic Syndrome, which requires meeting three of the above five criteria (American Heart Association, 2023). These are all key cardiovascular risk markers.

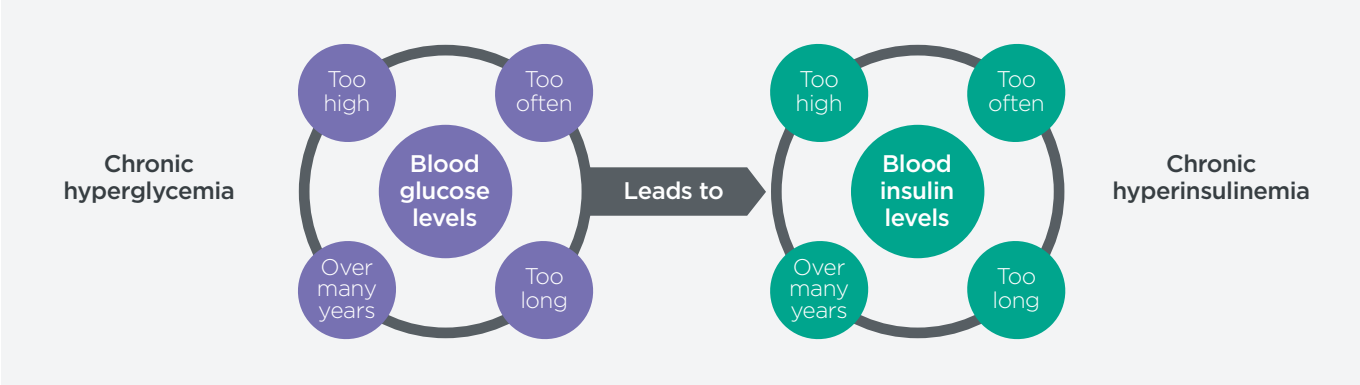
While medicine targets all these risk factors separately, there is little done to repair the underlying root cause, i.e., insulin resistance.

Insulin resistance

Insulin, a vital hormone produced by the pancreas, is primarily recognised for its role in regulating blood glucose levels, which is especially important for people with diabetes. The process is straightforward: insulin levels in the blood rise and fall in tandem with blood glucose levels, which are influenced by the carbohydrate content of food.

However, as *Figure 1* illustrates, this mechanism can become problematic. Poor dietary choices and unhealthy lifestyle habits can lead to consistently high glucose levels (hyperglycemia), which in turn causes insulin levels to remain elevated for prolonged periods (hyperinsulinemia). This can lead to insulin resistance, where the body needs more insulin than normal to manage blood sugar levels.

Figure 1: *Chronic hyperglycemia leads to chronic hyperinsulinemia.* Source: Swiss Re (2023).



Higher insulin levels are now known to influence biological pathways that store fat; slow metabolism; increase water retention, arterial rigidity and blood pressure; affect liver fat metabolism and eventually increase blood glucose levels (Kolb et al., 2020).

Unsurprisingly, interventions that focus on reducing insulin resistance show strong improvements in these related conditions. *Table 1* shows improvements in all five metabolic syndrome measures for a group of diabetics managed at a GP practice in the UK (Unwin et al., 2020).

More than cardiovascular disease

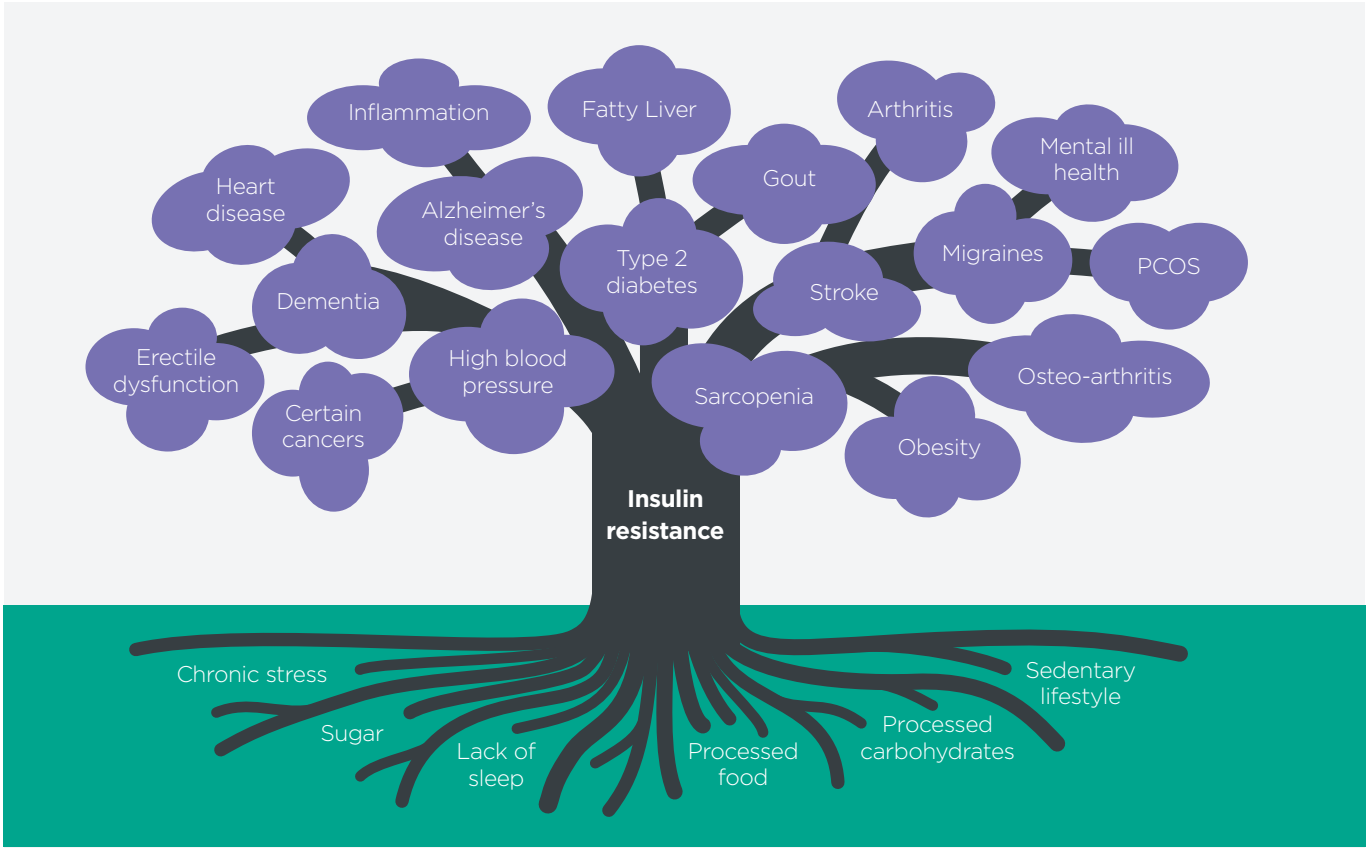
The implications of insulin issues extend beyond glucose regulation. Insulin impacts numerous biological pathways and interacts with receptors found in nearly every cell in the body. Hence when insulin levels are high, every system in the body is affected. When insulin levels are chronically high, a range of harmful effects across various systems can be triggered.

The diagrammatic representation given in *Figure 2* shows that many chronic conditions (in fact most non-communicable diseases) are linked to insulin resistance.

Table 1: *Outcomes over two years in a group of type 2 diabetics given metabolically appropriate nutritional guidance.* (Source: Swiss Re, 2023, reproduced with permission; data taken from Unwin et al., 2020.)

Sub-cohort of 45 patients with type 2 diabetes diagnosed >27 months before the introduction of lifestyle change. Bracketed figures show 95% confidence intervals.			
	Before	**After**	**p-value**
Age (years)	67 (57, 75)	-	-
Weight (kg)	96.2 (86.2, 106.2)	86.9 (76.9, 95.4)	<0.001
HbA1c (mmal/mol)	73 (62, 84)	49 (45, 56)	<0.001
Serum cholesterol (mmol/L)	4.6 (3.9, 5.1)	4.2 (3.6, 4.6)	0.01
HDL cholesterol (mmol/L	1.1 (0.8, 1.4)	1.2 (1.0, 1.4)	0.039
Triglyceride (mmol/L)	2.8 (1.7, 3.2)	1.7 (1.1, 2.2)	<0.001
Systolic BP (mmHg)	138 (130, 141)	131 (122, 139)	<0.004

Figure 2: *Insulin resistance is a root cause of most chronic conditions, not just cardiovascular disease.* (Source: Swiss Re, 2023, reproduced with permission.)



Of note is the link to mental ill-health, as well as migraines and neurodegenerative diseases like Alzheimer's.

Large studies have shown a strong association between mood and anxiety and certain 'traditional' clinical markers of insulin resistance, for instance an association between obesity and depression (Luppino et al., 2010; Bădescu et al., 2016). While these associations are strong, the overlapping biological mechanisms are only now beginning to be better understood.

Mental health: a new paradigm emerges

While a division exists between brain neurology and psychiatry, certainly in terms of specialism and treatment, they both clearly involve the brain. For over a century, intractable epilepsy in children – essentially hyper-excitable neuronal activity – has been treated with ketogenic diets. This has been shown to reduce glucose and insulin levels in the brain and increase ketone levels, significantly stabilising brain activity, and often reducing or eliminating seizures entirely.

The question is whether this could translate into better understanding of psychiatric disorders. As it turns out, it can.

For decades a prevalent belief has been that psychiatric disorders are due to inadequate neurotransmitter levels. Selective serotonin reuptake inhibitors (such as fluoxetine, better known as Prozac among others) as the primary therapy for depression was believed to be effective due to increasing serotonin levels in the brain. However, Moncrieff et al. (2020) found no evidence of reduced serotonin activity in people with depression compared to people without depression. The same paper found that methods to reduce serotonin availability (e.g. using tryptophan depletion) did not consistently lower mood in volunteers.

In addition, work done on bipolar disorder and other severe psychiatric disorders has shown that there is a significant issue related to the energy production in the brain as it relates to mental health (Bloomberg and Gleason, 2023).

Mitochondrial dysfunction and mental health

The brain is an energy-intensive organ, making up about 2% of the body's weight but consuming about 20% of its total energy supply. This high demand makes brain function particularly sensitive to changes in energy metabolism, often because of mitochondrial dysfunction. Conditions such as bipolar disorder, schizophrenia, depression and anxiety have been linked to changes in mitochondrial function.

Mitochondria, often described as the powerhouses of the cell, are critical to almost every aspect of our biology, including mental health. These tiny organelles generate the energy that fuels cellular functions across the body and brain. Understanding the basic biology of mitochondria, the importance of mitochondrial health for mental well-being, and how to maintain or improve mitochondrial function can offer insights into managing and potentially mitigating various mental health conditions.

Mitochondrial dysfunction can lead to decreased energy production, increased oxidative stress due to the imbalance between the production of free radicals and the body's ability to counteract their harmful effects, and dysregulation of calcium ion signalling, which is vital for neuron communication. Each of these effects can significantly impact brain function and health. For example, reduced Adenosine Triphosphate (ATP) levels and increased oxidative stress can impair neuron function and survival, contributing to the symptoms of various mental health disorders (Clemente-Suárez et al., 2023).

Brain energy

Dr Christopher Palmer, a well-known Harvard-trained psychiatrist working in the United States, has studied the history of psychiatric treatment and the successes found when mitochondrial energy production is a focus of therapy. As Palmer notes in his book *Brain Energy* (2022):

'The specific psychiatric disorders in which mitochondrial dysfunction has been identified include the following: schizophrenia, schizoaffective disorder, bipolar disorder, major depression, autism, anxiety disorders, obsessive-compulsive disorder, posttraumatic stress disorder, attention deficit/hyperactivity disorder, anorexia nervosa, alcohol use disorder (aka alcoholism), marijuana use disorder, opioid use disorder, and borderline personality disorder.' (Palmer, 2022)

Changes in lifestyle and nutrition have been used to successfully improve the symptoms of many patients, some with severe mental health issues. However, because there is no magic pill promising large profits, the costly studies required to test these interventions, which would typically be funded by the pharmaceutical sector, have been lacking. Generally, any validation has been through small numbers of anecdotal cases by interested psychiatrists.

Danan et al. (2022) noted a family member with mental health issues who went on a ketogenic diet for weight loss experienced significantly improved mental health symptoms. Subsequently, Dr Danan put thirty-one of his long-term psychiatric patients, all of whom suffered with severe mental health conditions, on a ketogenic diet. Of the twenty-eight that maintained the diet for more than fourteen days, twelve had been diagnosed with bipolar disorder type 2, six major depression, and ten with schizoaffective disorder.

All twenty-eight had been hospitalised to an inpatient clinic for the purpose of putting them on a ketogenic diet. The results were astonishing: 64% reduced medications, all had improved clinical outcomes, and 44% achieved clinical remission. The Hamilton Depression Rating Scale scores, the Montgomery-Åsberg Depression Rating Scale, and for those with schizoaffective illness, the Positive and Negative Syndrome Scale (PANSS) scores, all improved significantly ($p<0.001$).

A recent study by Stanford University psychiatrist Dr Shebani Seti, who coined the term 'Metabolic Psychiatry', showed similarly promising results (Bai, 2024). While the cardiovascular risk improvement across the cohort was unsurprisingly excellent, the improvement in mental health symptoms was also encouraging, 79% of participants showing clinically meaningful psychiatric improvement.

Metabolic mind

There have also been other cases of those suffering with bipolar disorder improving significantly and going into remission. One of the many bipolar sufferers who has had his life turned around is Matt Baszucki. After years of suffering, his parents heard of Dr Palmer and after changing his diet, Matt's symptoms significantly improved, his medications and their side effects reduced, and he is now in remission.

The Baszucki Group, set up by Matt's parents, has subsequently launched Metabolic Mind, a nonprofit organisation dedicated to, 'transforming the study and treatment of mental disorders by exploring the connection between metabolism and brain health' (Metabolic Mind, 2024).

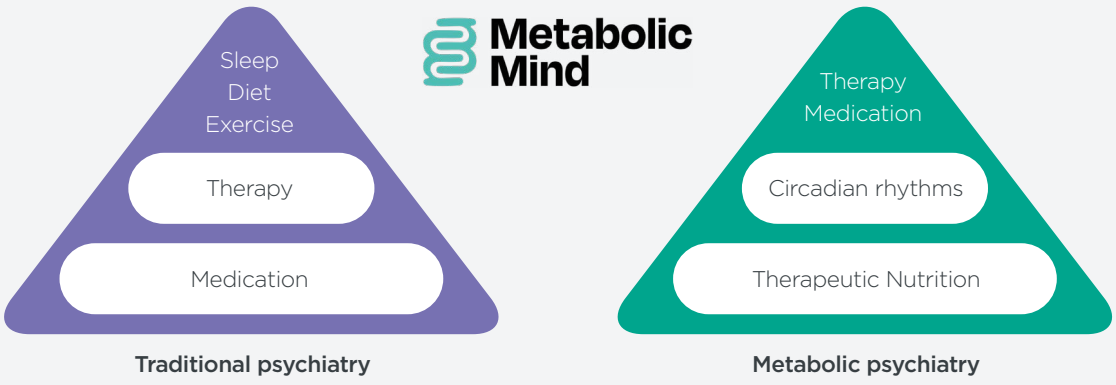
Figure 3: *Treating Mental Health Disorders as mitochondrial energy related metabolic disorders.* (Source: Metabolic Mind, 2024, reproduced with permission.)

Metabolic Mind is funding a number of initiatives, including ten active clinical trials looking not only at a number of conditions and clinical outcomes, but also the underlying biology, including neural network instability and neurobiological mechanisms. One study in particular is being carried out at the University of Oxford, investigating the use of dietary intervention for treatment-resistant depression (Gao et al., 2024).

Without the profit motive that typically underpins the testing of a new drug or developing a specific service that can be sold, research into dietary interventions would likely not be happening at this pace if not for substantial private funding. Separate to Metabolic Mind, the Baszuckis and two other families have committed US$150 million to BD^2, an endeavour to, 'advance scientific understanding that will lead to new interventions for preventing and treating bipolar disorder' (BD^2, 2023).

Dr Iain Campbell, a University of Edinburgh researcher, also suffered from bipolar disorder (BD) that was put into remission with a ketogenic diet. He is part of the network being supported by Metabolic Mind and has published a number of papers. One in particular gives insight into how diet impacts various cellular mechanisms in BD, and reviews 'evidence of hyperinsulinemia in BD as the primary cause of mitochondrial dysfunction' (Campbell and Campbell, 2020).

While many of the above studies focus on severe mental conditions, surveys in groups that have improved metabolic health through nutritional interventions have regularly shown better mental health outcomes. This is unsurprising. One would reasonably expect somebody who has lost weight, reduced medication and its side effects, and has a better health trajectory to 'feel better' about themselves. However, we now know that with improved nutrition, underlying brain energy and metabolism is improved, sleep can be improved, and exercise and movement would be easier. Thus, a combination of factors would likely be leading to these positive outcomes.



Metabolic Psychiatry: A paradigm shift in psychiatric treatment

Virta Health, a US company specialising in helping people manage and reverse diabetes, has published outcomes showing subclinical depressive symptoms significantly decreased over the first ten weeks of restricting carbohydrates, and reductions were maintained over two years (Adams et al., 2022). As Dr Georgia Ede, a Harvard-trained psychiatrist who focuses on metabolic psychiatry, mentions in her book *Change your Diet, Change your Mind* (2024): 'The most powerful way to change brain chemistry is with food, because that's where brain chemicals come from in the first place.' (Ede, 2024).

The fallacy of a binary diagnosis

Medicine is often practiced as a binary science, in the sense that you either meet the criteria for diagnosis or you don't. However, our bodies are not aware of that. We know blood pressure, lipids, weight, glucose, etc. are all risks lying on a continuous spectrum, but the necessity for a diagnostic treatment and epidemiological paradigm creates binary categories. A diabetes diagnosis is made when HbA1c is 6.5% (49mmol/mol) or higher. But 6.2% is a far higher risk than 5.5%. A blood pressure of 110/70 is far better than 130/80, but both are considered normotensive. Only when systolic pressure reaches 140mmHg does the 'hypertensive' label kick in.

In the same way, psychiatric diagnoses are binary in that they use binary cutoffs. Major depressive disorder is a DSM-5 diagnosis which requires five of nine criteria to be met:

- Persistently low or depressed mood
- Anhedonia or decreased interest in pleasurable activities
- Feelings of guilt or worthlessness
- Lack of energy
- Poor concentration
- Appetite changes
- Psychomotor retardation or agitation
- Sleep disturbances
- Suicidal thoughts, of which one must be a depressed mood or anhedonia causing social or occupational impairment.

Meeting three or four, or even six but without depressed mood or anhedonia causing social or occupational impairment, is technically interpreted as not quite meeting the benchmark, and would mean such a person is not classified as having a major depressive disorder (Alqahtani et al., 2023). The diagnosis of anxiety symptoms would be similar.

This explains the difference between the lifetime prevalence of major depressive disorder being 5–10% of the US population, but when surveys are carried out at a population level asking about symptoms of depression, stress or anxiety, the numbers are multiples of that for each of those symptoms, often up to a third of the population.

Our experience and analysis of income protection claims

When considering disability claims, insurance data generally requires a single cause of claim, yet these claims often occur in the setting of multimorbidity, and recording one pathology or condition does not well reflect the complexity of the case, or the state of metabolic ill-health.

An example of this was a 44-year-old female absent from work for ten months for a long COVID claim. Her symptoms were breathlessness, poor exercise tolerance, and low mood. Her medical history included impaired glucose tolerance and mild osteoarthritis. This claim seemed like a clear case until it came to her height and weight: 160cm with a weight of 137kg - a BMI of 53. While she may have had COVID, and long COVID may be playing a role in her current symptoms, metabolic ill-health was no doubt a part of this claim: her breathlessness and exercise intolerance, her osteoarthritis, and low mood. While not noted in the claim, this BMI likely meant the claimant would struggle to carry out everyday tasks and would likely be experiencing problems with sleep and other aspects of her life, including mental health, due to her increased weight and poor metabolic health. The claimant may have been advised to seek help for some of these individual issues, such as her cardiovascular or mental health, but it is unlikely that medical practitioners would be focusing on the root cause of the claimant's ill-health.

The combination of a binary diagnostic paradigm and a required single cause of claim means that in the context of disability claims, any potential root cause, its potential impact on the claim, or the opportunity to address it, is overlooked.

Swiss Re analysis

Swiss Re did an income protection (IP) claims analysis reviewing 277 IP claims with a duration of up to five years. While 60% had no information on weight, the information on the 40% of claimants where we could determine weight at the claims stage allowed us to focus on obesity, arguably the most evident expression of metabolic dysfunction. The results highlighted that 70% of claimants who had provided weight information were overweight or obese, with 45% of those claimants falling into the obese category.

Considering that psychiatric and musculoskeletal conditions make up the majority of IP claims, and we know being overweight will typically affect both those conditions, that 60% of all IP claimants had no information available regarding weight is troublesome. Even more alarming is that 75% of known obese IP claimants did not have this listed as a condition in their GP records.

From analysing comorbidities, we concluded that in 18.4% of the long-term IP claims analysed obesity was considered the primary driver of claim.

A new approach

The following quote highlights what one hears regularly when people have restored their metabolic health. While the quote comes from Virta Health in the US context of type 2 diabetes remission, there are opportunities to replicate this kind of outcome in the UK disability market.

> *'Before Virta, I was taking 14 different medications for my diabetes, high blood pressure, and mental health issues—stuck in a vicious cycle of always taking more medications, yet never feeling better. Two years later, I've reversed my diabetes, and no longer suffer from insomnia, panic attacks, and PTSD. Plus, I've lost 45 pounds and am off all 14 drugs. With the support of Virta, I've completely changed the trajectory of my mental and physical health.'* (Virta Health, 2022)

We are trialling an intervention at Swiss Re where IP policyholders currently on a long-term claim are triaged to determine the likelihood of metabolic ill-health playing a significant role in their multimorbidity. Where that seems likely, and the individual is looking to improve their health, we offer a six-night in-patient metabolic health programme followed by 12 months of support and follow up.

We believe that a substantial proportion of these individuals will improve their health significantly enough to return to work. While this is great for the policy payer, it is also a huge benefit to society as a whole, for employers and fellow employees, and most importantly it can change the lives of the individuals concerned.

We are excited to share a quote from one of the first pilot candidates following the week-long in-patient stay. At discharge, she provided this feedback:

> *'I can't believe I haven't heard about metabolic health before. Everyone should know about it. It explains so much of my problems and now I've got hope that my health can improve. Watch this space.'*

The outcomes of this pilot will be published once a sufficient number of claimants have taken part. We believe that earlier and lighter touch interventions before claims occur would be worth considering. Eventually we could offer health interventions for a disability in force book as a whole, first targeting those most obviously metabolically ill, and progressively across the portfolio.

For serious mental health conditions, like bipolar disorder, reducing carbohydrate consumption to the level that it induces ketogenesis may be instrumental in producing the desired therapeutic effect. However, we lack data as to the changes required to improve insulin resistance sufficiently in more mild cases. While evidence suggests that sugar consumption should be limited or completely avoided, the extent to which reductions in overall insulin-producing macronutrients (carbohydrates in general) are advisable is yet to be determined. Similarly, the time or frequency of limited reductions of carbohydrates macronutrients, eating order, combinations to avoid the sugar spike and insulin spikes, and how to personalise all of this.

However, it is clear that changes in lifestyle, and nutrition in particular, can make a significant positive difference to both metabolic and mental health, and most importantly, they can address a root cause of so many non-communicable diseases: insulin resistance.

References

Adams, R.N., Athinarayanan, S.J., McKenzie, A.L., et al. (2022). Depressive symptoms improve over 2 years of type 2 diabetes treatment via a digital continuous remote care intervention focused on carbohydrate restriction. *Journal of Behavioral Medicine*, 45: 416–427. **https://doi.org/10.1007/s10865-021-00272-4**

Alqahtani, I., Al-Garni, A., Abumelha, M., et al. (2023). Prevalence of depression, anxiety, and stress among the general population during COVID-19 pandemic: a systematic review. *Journal of Family Medicine and Primary Care*, 12(6): 1030-1037. **https://doi.org/10.4103/jfmpc.jfmpc_1943_22**

American Heart Association (2023). *What is Metabolic Syndrome?* **https://www.heart.org/en/health-topics/metabolic-syndrome/about-metabolic-syndrome** [Accessed 20 May 2024.]

Bădescu, S., Tătaru, C., Kobylinska, L., et al. (2016). The association between Diabetes mellitus and depression. *Journal of Medicine and Life*, 9(2): 120-5. **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4863499/** [Accessed 21 May 2024.]

Bai, N. (2024). Pilot study shows ketogenic diet improves severe mental illness. *Stanford Medicine News Centre*, 1 April. **https://med.stanford.edu/news/all-news/2024/04/keto-diet-me [Accessed ntal-illness.html** [Accessed 20 May 2024.]

BD^2 (2023). *Breakthrough discoveries for thriving with bipolar disorder.* **https://www.bipolardiscoveries.org/** [Accessed 20 May 2024.]

Bloomberg, S. and Gleason, V. (2023). Brain energy: new hope – treating mental health disorders as metabolic disorders. *Harvard Advanced Leadership Initiative Social Impact Review*, 18 July. **https://www.sir.advancedleadership.harvard.edu/articles/brain-energy-new-hope-treating-mental-health-disorders-metabolic-disorders** [Accessed 30 May 2024.]

Campbell, I. and Campbell, H. (2020). Mechanisms of insulin resistance, mitochondrial dysfunction and the action of the ketogenic diet in bipolar disorder. Focus on the PI3K/AKT/HIF1-a pathway. *Medical Hypotheses*, 145, Dec. **https://doi.org/10.1016/j.mehy.2020.110299**

Clemente-Suárez, V., Redondo-Flórez, L., Beltrán-Velasco, A., et al. (2023). Mitochondria and brain disease: a comprehensive review of pathological mechanisms and therapeutic opportunities. *Biomedicines,* 11(9): 2488. **https://doi.org/10.3390/biomedicines11092488**

Danan, A., Westman, E., Saslow, L., et al. (2022). The ketogenic diet for refractory mental illness: a retrospective analysis of 31 inpatients. *Frontiers in Psychiatry*, 13, 6 July. **https://doi.org/10.3389/fpsyt.2022.951376**

Ede, G. (2024). *Change your diet, change your mind: a powerful plan to improve mood, overcome anxiety, and protect memory for a lifetime of optimal mental health.* New York: Balance.

Gao, M., Chang, M. and Aveyard, P. (2024). *Ketogenic diet for treatment-resistant depression: dietary interventions for MEntal Health Study (DIME).* **https://clinicaltrials.gov/study/NCT06091163** [Accessed 21 May 2024.]

Kolb, H., Kempf, K., Röhling, M., et al. (2020). Insulin: too much of a good thing is bad. *BMC Medicine*, 18: 224. **https://doi.org/10.1186/s12916-020-01688-6**

Luppino, F., de Wit, L., Bouvy, P., et al. (2010). Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. *Archives of General Psychiatry,* 67(3): 220-229. **https://doi.org/10.1001/archgenpsychiatry.2010.2**

Metabolic Mind (2024). *Research.* **https://www.metabolicmind.org/research** [Accessed 21 May 2024.]

Moncrieff, J., Cooper, R., Stockmann, T. et al. (2023) The serotonin theory of depression: a systematic umbrella review of the evidence. *Molecular Psychiatry,* 28: 3243-3256. **https://doi.org/10.1038/s41380-022-01661-0**

Palmer, C. (2022). *Brain energy: a revolutionary breakthrough in understanding mental health - and improving treatment for anxiety, depression, OCD, PTSD, and more.* Dallas: BenBella Books

Swiss Re (2023). *Metabolic health: tackling wellbeing from the inside out.* **https://www.swissre.com/reinsurance/insights/tackling-wellbeing-from-the-inside-out.html** [Accessed 24 July 2024.]

Unwin, D., Khalid, A., Unwin, J., et al. (2020). Insights from a general practice service evaluation supporting a lower carbohydrate diet in patients with type 2 diabetes mellitus and prediabetes: a secondary analysis of routine clinic data including HbA1c, weight and prescribing over 6 years. *BMJ Nutrition, Prevention & Health,* 3(2). **https://doi.org/10.1136/bmjnph-2020-000072**

Virta Health (2022). *Patients receiving Virta's diabetes reversal treatment see sustained reduction in depressive symptoms, new research shows.* 2 Feb. **https://www.virtahealth.com/press/patients-receiving-virtas-diabetes-reversal-treatment-see-sustained-reduction-in-depressive-symptoms-new-research-shows** [Accessed 21 May 2024.]

Dr John Schoonbee

Dr John Schoonbee is a medical doctor who joined Swiss Re in 2011. He is based in Zurich and has been involved in many aspects of life insurance, including product development, risk and claims assessment, as well as helping price some of the more complex medical life and health products. John became Swiss Re's Global Chief Medical Officer in 2017 and works with a large team of permanent and consultant medical doctors. He leads the research for Life Guide, Swiss Re's world leading underwriting manual. In addition to focusing on medical R&D and key global health topics, John initiated a collaboration between Swiss Re and the *BMJ* to host the landmark 'Food for Thought' series of events and publications focusing on Nutritional Science.

Using behavioural science to help claimants return to work

Dr Peter Hovard, Lead Behavioural Scientist at Reinsurance Group of America (RGA)

Helping policyholders protect and improve their mental health is an area of focus for most life and health insurers. It is particularly important for providers of disability and income protection. These insurers have a responsibility, where possible, to help claimants return to work safely and in a timely manner. This can be challenging, as the causes of an illness or injury can be multifaceted and not always readily apparent. This is particularly true in mental health claims, which are increasing in prevalence and complexity.

Behavioural science combines insights from disciplines such as psychology, economics, neuroscience and sociology to better understand how and why people behave and make decisions. Behavioural science techniques can help facilitate return-to-work (RTW) after a temporary disability. For example, behavioural science can improve the assessment and management of claims by developing simplified claims questionnaires which elicit better information and can help claims assessors use more effective goal-setting and striving techniques to support a claimant's motivation to recover from their illnesses and injuries.

Many insurers are keen to embed behavioural science techniques within their claims processes, but the techniques need to deliver tangible benefits whilst not being overly time-consuming for claimants or claims assessors.

RGA trials conducted for clients around the world are showing that behavioural science techniques can be applied effectively and efficiently. For a small initial investment of time, the techniques can be successfully incorporated into every phase of the claims process, benefitting the claimant and the insurer.

The mental health challenge in disability and income protection products

Disability and income protection is an important insurance product that protects workers and their families in times of need. For most claimants, the insurance provides temporary financial support during periods of illness or injury before they regain the capability to go back to work.

It is widely recognised that long-term absence from work can be harmful to an individual's physical and mental well-being (Rueda et al., 2012). Returning to work can benefit the claimant, their families, and their employers, as well as keeping insurance affordable for others.

Mental health problems are becoming a large and increasing proportion of disability and income protection claims. They affect nearly one billion people globally (WHO, 2020) and account for nearly one-third of total Years Lived with Disability (YLD) (Arias et al., 2022).

In 2023, RGA conducted seventeen qualitative interviews with life and health insurance companies from around the world, followed by an online quantitative survey with 137 respondents. Mental health ranked as a top or moderate priority for 85% of respondents, and evolving claims approaches and practices were identified as one of the most important aspects. Mental health claims are often more difficult to manage than other claim types, for reasons that include the impact of mental health conditions on motivation to RTW and the prevalence of co-morbidities.

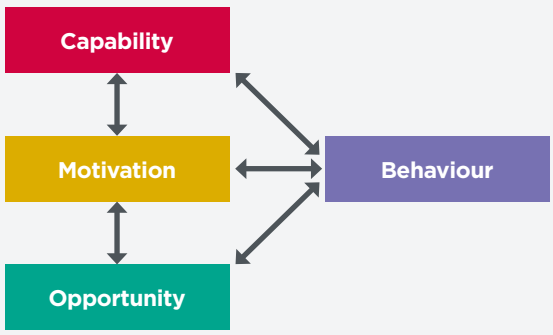
Embedding behavioural science techniques into claims forms and the goal-setting and goal-striving process can help facilitate return to work after a temporary disability. However, insurers often find it hard to implement these techniques effectively into claims process. They must be embedded throughout the process, and claims assessors play an important role in their delivery.

What are these behavioural science techniques, and how can their implementation be made simple and effective?

Using a behavioural science approach to understand and aid RTW

Figure 1 shows a COM-B model of behaviour change used in many domains, particularly health, for identifying what needs to change for a behavioural intervention to be effective (Michie et al., 2011). It identifies three factors that typically need to be present for a behavioural change to occur: **Capability**, **Opportunity**, and **Motivation**.

Figure 1: *COM-B model of behavioural change* (Source: Michie et al., 2011, Fig.1, licensed under **CC BY 2.0 DEED**)



COM-B can be a useful overarching framework when considering how best to help claimants return to work, as it is important to assess whether an individual claimant has the capability, opportunity, and motivation to do so.

Lack of **capability** to work – whether for physical or mental reasons – is the primary reason for a disability and income protection claim. Illness or injury can render an insured person temporarily incapable of performing their job functions.

Once capability has returned, **opportunity** to work becomes key, especially if the insured person has either lost their job or if their working capabilities have changed so that they can no longer perform their current duties. The challenge is then to find alternative employment that meets their changed capabilities.

Motivation is also needed to recover capability and maximise opportunities. Motivation is not independent of the other factors; it is partly influenced by how individuals perceive their capability and opportunity. Once capability and opportunity conditions are met, low or conflicting motivations can often be a barrier to a timely RTW. Helping claimants harness their motivation and increase their perceived capability are key aspects of claims management.

Improving occupational duties disclosure

Assessing a claimant's current occupational duties is key to understanding their capability and opportunity. Claims assessors need to understand what makes an RTW difficult, and how a job could be adapted to enable a quicker and safer RTW. This is particularly important for mental health claims, where issues may be caused by less visible aspects of a job. However, the information collected on claim forms is often inadequate, making the process harder and more time-consuming.

Claims forms typically ask claimants to record their occupational duties using open-format questions, such as 'Please describe the duties of your occupation' followed by a free-text input field. While such questions appear simple, it is a cognitively demanding task as most people have not previously considered their occupational duties.

To answer the questions, a claimant must:

- Decide what is a typical workday
- Remember what they do (their duties) during a typical day
- Mentally categorise the information into usable categories
- Decide what information is most relevant to the claims assessor and how detailed the descriptions need to be
- Estimate how much time on average is spent on a specific duty (often claimants are asked to calculate it as a percentage)
- Repeat for each duty

Many claimants, understandably, skip these complex steps and record the least amount of information they feel they can provide to answer the question. This results in extra work as a follow-up telephone call or form will be required to obtain the missing information.

Figure 2 shows a typical example, taken from a genuine claim form, of how claimants sometimes respond to open-format occupational duties questions with free-text fields:

Figure 2: *Example response to a typical open-format, free-text response question*

Q. What was your occupation at the time you became disabled?

A. General Practitioner

Q. What were the specific duties of your occupation and what percentage of time did you spend performing each duty?

A. General Practitioner – 100%

RGA hypothesised that giving more guidance to claimants in the occupational duties question would reduce cognitive strain, which in turn would increase disclosure, improve the claimant experience, and reduce the need for follow-up conversations.

In a study of 8,000 people in Australia, Canada, the United States and South Africa, RGA tested alternative versions of the occupational duties question alongside the typical free-text question.

Each alternative version provided different levels of guidance to the claimant to help make answering the question easier. For example, two versions used checklists which, although making the question longer, clarified the information required and therefore reduced the amount of mental effort required to answer the question. One checklist provided a comprehensive list of relevant duties requiring respondents to record the frequency of performing those duties on a scale from 'None at all' to 'All or most of the time'. *Figure 3* shows the other checklist which used the same frequency scale but was shorter, grouping duties into categories.

Figure 3: *Example of a short checklist*

In a typical workday, how much of your time is spent on the following duties?

	None at all	A little	A moderate amount	A lot	Most or all of the time
Administrative / desk duties: sitting at a workstation without handling heavy objects	○	○	○	○	○
Supervisory in an office: planning and directing a team or business, or supervising other people	○	○	○	○	○
Supervisory in a non-office: planning and directing a team or business, or supervising other people	○	○	○	○	○
Executive duties: decision making, developing strategy or planning business activities	○	○	○	○	○
Travel: by car or other transport, excluding travelling to/from your place of work	○	○	○	○	○
Light manual: walking, standing, kneeling, climbing, negotiating stairs, ladders, and uneven terrains	○	○	○	○	○

Participants were randomly assigned to answer one of the question types as part of a lifestyle survey. The question response time was measured, and the respondents asked to rate their experience. The quality of the information provided by the respondents was assessed by randomly selecting responses from each of the different versions and asking RGA claims experts to rate the value of the information provided, without knowing how the question was asked.

Short checklists were by far the most effective of the question versions tested. The results of the experiment showed that:

- **Short checklists improve the quality of the occupational duties information.**
  Claims experts rated 'usefulness of disclosure' at 7/10 for the short checklists compared to only 2/10 for the free-text question, and rated the checklist response as much less likely to require a follow-up call. The results from the short checklist were rated as more useful than those from the full checklist as it was easier to synthesize the information and make judgements.
- **Short checklists took a little longer to answer but were perceived as quicker to answer.**
  Short checklists took 16 seconds longer to complete than free-text questions – a small trade-off given the extra disclosures. Also, respondents rated the short checklist as quicker to answer even though it took more time, showing the experience felt less effortful.
- **Short checklists improve the claimant experience.**
  Short checklists were rated by respondents as easier and clearer to understand than free-text questions. Respondents were less likely to say they omitted detail to hurry through the question when using short checklists compared to the free text questions.

This research demonstrated that checklist-based occupational duties questions, such as those in *Figure 3*, frequently produce better quality information for the insurer and a better experience for claimants. Therefore, applying this behaviourally enhanced questionnaire improves the effectiveness and efficiency of the claims process.

The research also shows that delivering simple processes for claimants is about more than just creating the shortest form possible. It requires an understanding of how information is mentally processed and the ability to help reduce complexity. There is a clear opportunity to apply this approach to other aspects of claims processes, for example, in medical questionnaires.

Effective RTW goal-setting

Obtaining comprehensive and accurate occupational information is a crucial part of assessing capability and opportunity. Motivation is then needed to regain capability, take opportunities and, ultimately, return to work. This is particularly important in mental health claims, where the condition itself may be impacting motivation.

Many insurers already try to identify claimants' RTW motivations within their claims processes, but rarely is the approach complete and comprehensive. By following simple best-practice behavioural science approaches, many insurers could significantly improve the effectiveness of what they are already spending time trying to do – help claimants recover and, ideally, return to full functionality.

One significant source of motivation for all behaviours is the existence and pursuit of goals. Goals can help people assume ownership of objectives and focus their attention. A high level of commitment is attained when an individual is convinced their goals are important and attainable.

For that reason, helping claimants set the right goals can be crucial. Insurers who employ goal-setting techniques typically focus on setting a RTW date. Our experience shows that this goal, if appropriate for the claimant, can benefit from considering the wider benefits of RTW, such as the desire to meet colleagues again and receive validation from work. An additional effective strategy can be to combine this RTW goal with a claimant's personal, non-work-related goals. While these may not be specific to RTW, our research shows they may help its facilitation. For example, a goal to play sport again may help to overcome an illness or injury which ultimately facilitates a RTW.

Setting a goal is rarely enough on its own: a plan for achieving that goal is needed, particularly where there may be a perceived lack of capability. This is where goal-striving techniques come into play. Identifying stumbling blocks and barriers and deciding in advance how best to overcome them is key. One technique that works well is the use of 'if/then' plans, where claims assessors help claimants identify that 'if' a certain challenging event happens, 'then' they will respond in a prepared way designed to overcome their usual habits in these situations.

Goal-setting and goal-striving techniques have been used successfully to aid RTW. In 2016, a trial by the New South Wales Government involving more than 1,700 workers found that behavioural science techniques to improve goal-setting and simplify customer communications meant claimants were over three times more likely to return to work within 45 days (NSW Government, 2016). However, insurers often find it hard to implement these techniques effectively into claims processes, as they must be embedded throughout the process. Claims assessors play an important role in their delivery.

RGA has developed and tested ways to embed goal-setting and goal-striving techniques into claims processes to maximise their potential. Behaviourally enhanced claims forms, telephone interview guides, and email communications have been designed that make the process easier to use for claimants and claims assessors. These goal-setting and goal-striving techniques do not replace medical treatments and plans, especially specialist mental health counselling, but they do enhance the support that insurers can provide.

Trials with insurers around the world have demonstrated the success of the approach. For example, in a recent trial, three-quarters of claimants set themselves motivating goals that were aligned with RTW outcomes. Feedback from claims assessors indicated that their satisfaction and engagement levels were very high, and they felt the process was improving claimant engagement and return to work outcomes. The goal-setting approach has now been permanently adopted.

Future areas of focus

The results of RGA's trials have shown that, for a small investment of time, behavioural science can be successfully incorporated into key phases of the claims process, from filling out claims forms to setting goals and making recovery plans.

However, there is more still to be done. In RGA's mental health survey, the top-rated challenge regarding the assessment and management of disability claims was 'difficulty receiving support from the attending physician in facilitating return-to-work support'. Can behavioural science help us better engage with medical professionals and make their involvement easier and more impactful? RGA is planning new research in this area, and we look forward to sharing our findings

References

Arias, D., Saxena, S. and Verguet, S. (2022). Quantifying the global burden of mental disorders and their economic value. *eClinicalMedicine*, 54: 101675. **https://doi.org/10.1016/j.eclinm.2022.101675**

Michie, S., van Stralen, M.M. and West, R. (2011). The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation Science*, 6, 42. **https://doi.org/10.1186/1748-5908-6-42**

NSW Government (2016). *Applying behavioural insights to return to work: report on the trial undertaken by the Behavioural Insights Unit, Allianz and the Department of Education.* **https://www.nsw.gov.au/sites/default/files/2021-05/Applying-Behavioural-Insights-to-Return-to-Work_0.pdf** [Accessed 15 May 2024.]

Rueda, S., Chambers, L., Wilson, M., et al. (2012). Association of returning to work with better health in working-aged adults: a systematic review. *American Journal of Public Health,* 102(3): 541-556. **https://doi.org/10.2105/AJPH.2011.300401**

World Health Organization (WHO) (2020). *Joint release by the World Health Organization, United for Global Mental Health and the World Federation for Mental Health.* **www.who.int/news/item/07-10-2020-global-challenge-for-movement-on-mental-health-kicks-off-as-lack-of-investment-in-mental-health-leaves-millions-without-access-to-services** [Accessed 15 May 2024.]

Dr Peter Hovard

Dr Peter Hovard is Lead Behavioural Scientist at RGA, based in RGA's London (UK) office and working globally. His role is to apply behavioural science principles and methods to RGA and clients' challenges in distribution, underwriting, claims, risk management and customer engagement. Peter previously worked as Behavioural Science Lead for UK general insurer RSA. He has a Ph.D. in the psychobiology of eating behaviour and appetite from the University of Sussex.

The COVID-19 pandemic and its impact on mental health

Dr Chris Martin, Managing Director at Crystallise Ltd.

The first case of COVID-19 detected in the UK was on 31 January 2020 (UK Government, 2022). A lockdown was imposed on 23 March, confining people to their homes other than for proscribed circumstances. The population was anxious and fearful. By mid-June, the first wave of the pandemic was abating, and lockdown regulations beginning to be relaxed, but high rates of anxiety persisted. A new condition, 'long COVID', emerged that cast a shadow over the recovery from the pandemic. There was a great deal of uncertainty about the long-term effects and implications. It is no surprise that the pandemic has had a profound effect on the mental health of the nation that will take a long time to play out.

There were obvious physical consequences to COVID-19 infection, but there has also been a significant and often hidden impact on mental health. Mental health problems are over three times more likely to lead to sickness absence than physical conditions (Bryan et al., 2021).

Published evidence needs careful interpretation. Some is counter-intuitive, particularly if derived from comparisons across different studies with different populations, methods, measures of mental health and biases. For example, a meta-analysis of studies suggested anxiety was more common in those with COVID-19 who were not hospitalised compared to those who were. This is probably a spurious result arising from study comparisons. A within-study comparison showed that hospitalisation and being bedbound for at least a week was associated with a higher prevalence of mental health problems in COVID-19 survivors. Where possible, large longitudinal or cohort studies should be used to obtain a more accurate picture (Badenochm et al., 2022; Magnúsdóttir et al., 2022).

Fatigue and poor sleep are the commonest mental health problems in those who experience COVID-19

COVID-19 appears to have had a significant impact on cognitive and mental health that can persist for a year or more. Problems include anxiety, depression, sleep disturbance, fatigue, 'brain fog' and poor memory. Sleep disturbance and fatigue are the commonest ongoing symptoms affecting mental health with about a quarter of people being affected (Figure 1). The risk appears to vary by severity, with hospitalisation and being bedridden for at least seven days being risk factors. Other risk factors include being female, middle-age (40–59) and a history of mental health problems prior to SARS-CoV-2 infection (Bonazza et al., 2022; Evans et al., 2021; Global Burden of Disease Long COVID Collaborators, 2022; Hastie et al., 2023).

Figure 1. *Frequency of mental health disorders in COVID-19 patients box-whisker plot* (Data taken from Nasserie et al., 2021).

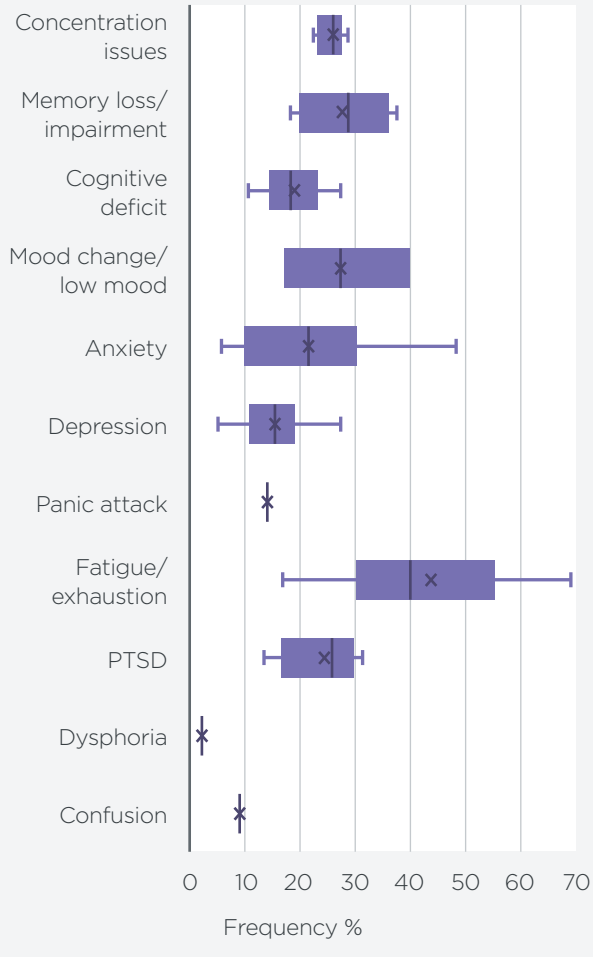


Figure 2. *Drivers of mental health disorders relating to the COVID-19 pandemic.*

The causes of these symptoms are partly explained by the stress of fear, isolation, unemployment, and the financial consequences and social disruptions surrounding the pandemic. However, there is a reason to believe that there are psychological consequences of direct physical injury (*Figure 2*). SARS-CoV-2 infection could trigger marked inflammatory and dysfunctional immune responses triggering injury to nerve cells in the brain. In postmortem studies of animals which have been infected with SARS-CoV-2, even mild infections could result in inflammation of nerve cells. For those hospitalised with COVID-19, injury from the consequences of severe disease, such as hypoxia, blood clots in the brain, or the toxic effects of medications such as steroids, also play a part (Fernández-Castañeda et al., 2022; Klein et al., 2021; Muccioli et al., 2020).

Anxiety and depression since the pandemic

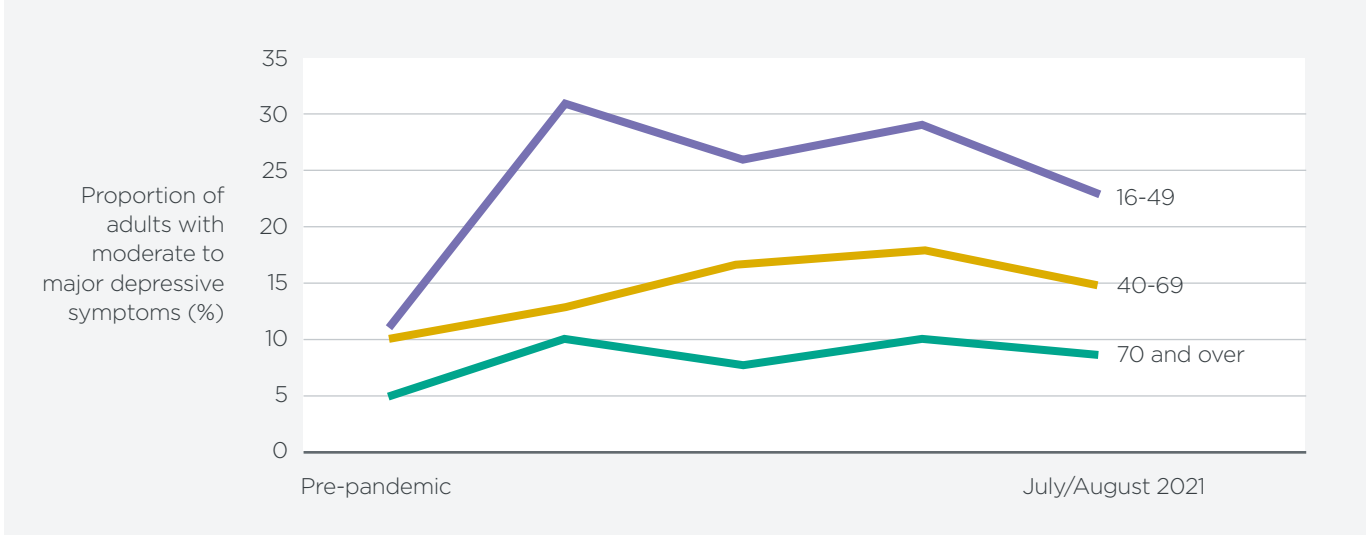
The prevalence rates of anxiety and depression have risen in the general population since the pandemic. Ideally, we would make comparisons with those who have never had COVID-19. However, almost everybody has, though many will not have been noticeably unwell.

During the pandemic, there was a sharp rise in the proportion of adults reporting moderate to severe depressive symptoms, particularly women, younger people, those with existing mental or physical health conditions, minorities and the socially disadvantaged (Gao et al., 2022). The proportion of young adults with moderate to severe depression rose by 20% during the pandemic, but only rose by 5% in those aged 70 years and over *(Figure 3)*.

Taking a closer look at young people, mental ill-health is an issue of growing concern. McCurdy and Murphy (2024) reported an alarming rise in mental health problems in persons aged 18–24 years. For the first time, the odds of sickness absences due to mental health issues are higher among individuals in their early twenties compared to those in their early forties. This may have been further exacerbated by the pandemic.

Whilst in absolute terms anxiety and depression is more prevalent in more deprived areas, in the UK Household Longitudinal Study, the largest absolute rises in the pandemic were seen in the highest income groups and those with a university degree (16%) compared to the general population (10%) (Daly et al., 2022).

Figure 3. *Percentage of adults by age-group with moderate to severe depressive symptoms, Great Britain, July 2019 to August 2021* (Source: Office for National Statistics, 2021, licensed under **Open Government Licence v.3**).



Mental ill-health in healthcare workers

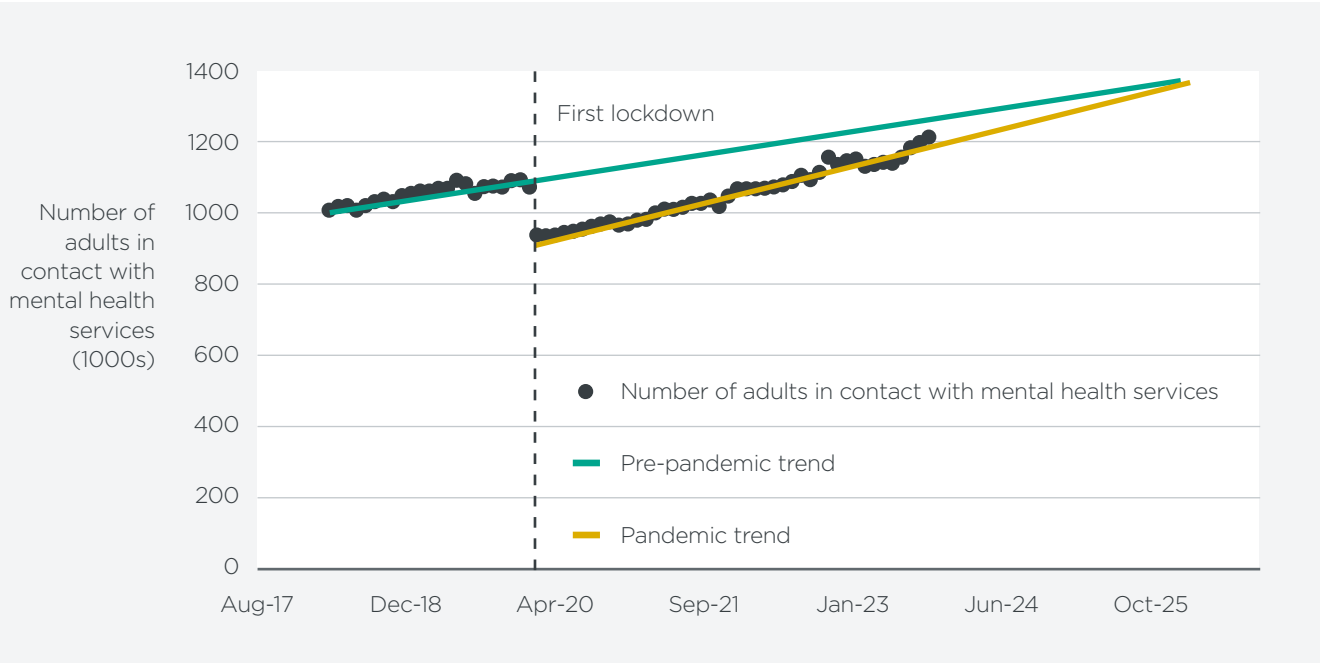
There was a surge in episodes of prolonged sickness absences from mental ill-health among healthcare workers, who faced extraordinary pressures during the pandemic. Demand for their services was extremely high and the logistics of working became more difficult. For healthcare workers with patient contact, whilst the personal risk of death was greater than the general population only in the early part of the pandemic, they were in close regular contact with people with COVID-19 and had a high sense of personal risk. They witnessed tragic events first-hand very frequently and had to cope with the phenomenon of 'moral distress', where a health care worker feels unable to provide ethically sound care because of overwhelming demand and a lack of time and resources (Cherrie et al., 2022; Lim et al., 2023; Nagle et al., 2023).

The prevalence of moderate to severe symptoms of anxiety and depression amongst health care workers almost quadrupled early in the pandemic compared to pre-pandemic levels (Gilleen et al., 2021). There was a surge in new episodes of prolonged absence (greater than 28 days) for mental ill-health and days lost due to mental ill-health among health care workers. Almost 6% of all health care workers had an episode of sickness absence due to mental health problems up to July 2020, and the total number of days lost due to mental health problems rose by nearly three-quarters between 2019 and 2020. Interestingly, the total number of days lost for doctors and dentists fell over that time. It has been suggested that this could relate to 'presenteeism' where individuals continue to work when ill because of service needs and fear of letting colleagues down. However, it is also worth noting that many dentists were unable to work during this time and so episodes of illness would not be recorded in sickness absence.

We are witnessing a rise in the demand for mental health services in England, following an initial decrease during the acute phase of the pandemic.

Health care services were severely disrupted by the COVID-19 pandemic, and mental health services were no exception. Mental health care bed capacity was redeployed to care for patients with COVID-19 infection and staff sickness absence rates were high. Whilst routine referrals and admissions for mental health care both fell early in the pandemic, and there was a fall in first diagnosis of common mental disorders - referrals for crisis interventions went up. This paints a picture of a reduction in routine care with a consequent increase in destabilisation of those with severe mental illness and later diagnosis of new mental health episodes requiring more urgent and active intervention. It was estimated there would be a 33% rise in new referrals to mental health facilities by the end of 2023 and this seems to have happened. Some of the rise reflects the ongoing trend pre-pandemic, but much of it relates to the catch-up of people lost to care during the acute pandemic (The Strategy Unit/NHS, 2020). Projecting forwards, and assuming the underlying trends persist, we would not expect to catch-up with the backlog until about March 2026 *(Figure 4).*

Figure 4: *Projecting forward the pre-pandemic and post-pandemic trend of contact with Mental Health Service in England.* (Data taken from NHS England, 2023.)



Psychological distress among UK workers

The COVID-19 pandemic may have precipitated a rise in psychological distress among UK workers. The pandemic arguably precipitated the biggest disruption and reconfiguration of patterns of work in the UK since the Second World War. There were big increases in home working, job losses and sickness absence rates. An analysis of longitudinal data in the UK explored the impact of COVID by industry, socio-economic group and occupation.

The industries with the highest odds of psychological distress relative to pre-pandemic levels, as defined in the Office for National Statistics (ONS) Standard Industrial Classification (SIC) (**https://www.ons.gov.uk/methodology/classificationsandstandards/ukstandardindustrialclassificationofeconomicactivities/uksic2007**), were the professional, scientific and technical, and manufacturing industries which experienced a tripling of rates, and with a similar pattern across all socio-economic groups within those industries (*Figure 5*).

Figure 5. *Odds ratio for rise in moderate to major depressive symptoms in the COVID-19 pandemic by industry.*
(Data taken from Kromydas et al. (2022), data supplement 1.)

The odds for increased psychological distress post-pandemic by socio-economic group as defined by the National Statistics Socio-economic Classification (NSSEC) (**https://www.ons.gov.uk/methodology/classificationsandstandards/otherclassifications/thenationalstatisticssocioeconomicclassificationnssecrebasedonsoc2010**) was lowest in the 'routine' occupations consisting of highly repetitive and predictable jobs, such as manufacturing, cleaning and manual labour (odds ratio 1.66). It was highest in the 'small employers and own account' occupations (odds ratio 3.24) consisting of non-professional self-employed people with direct control over their business and who may also employ a small number of others. This would include small business owners, and trades and crafts people (Figure 6).

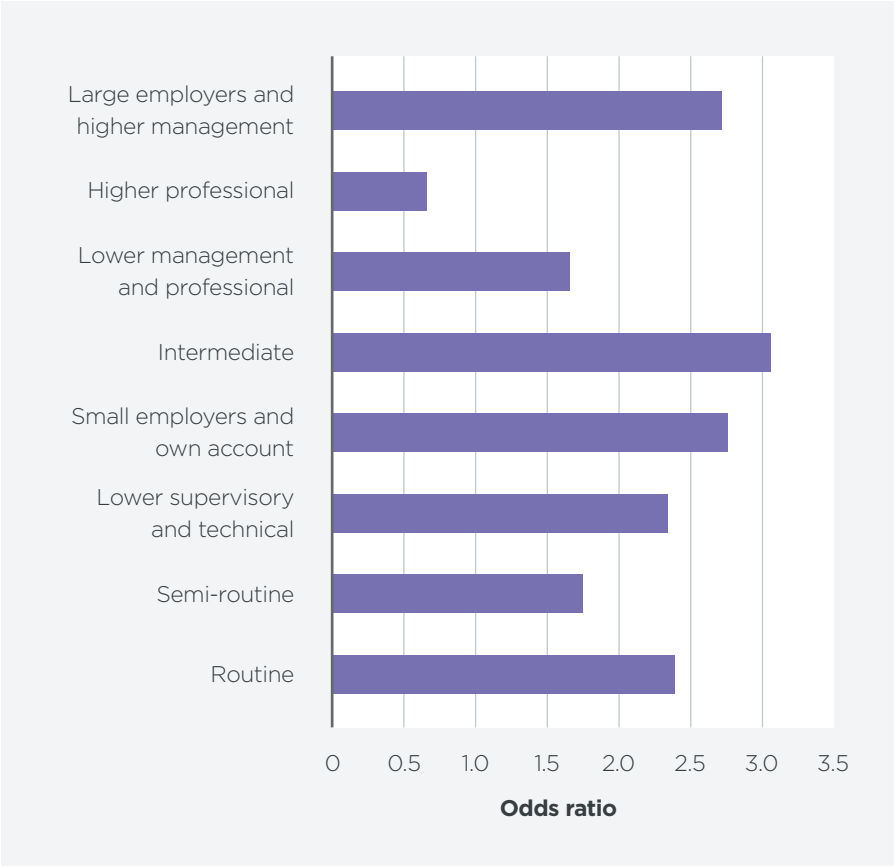


Figure 6. *(Opposite top) Odds ratio for moderate to major depressive symptoms by socioeconomic group (NS-SEC).* (Data taken from Kromydas et al. (2022), data supplement 1.)

Psychological distress increased across all occupations in the 'Standard Occupational Classification' (SOC) (**https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassificationsoc**) used by the Office for National Statistics and rates increased threefold among 'sales and customer service' and almost tripled in 'skilled trades occupations'. (Figure 7).

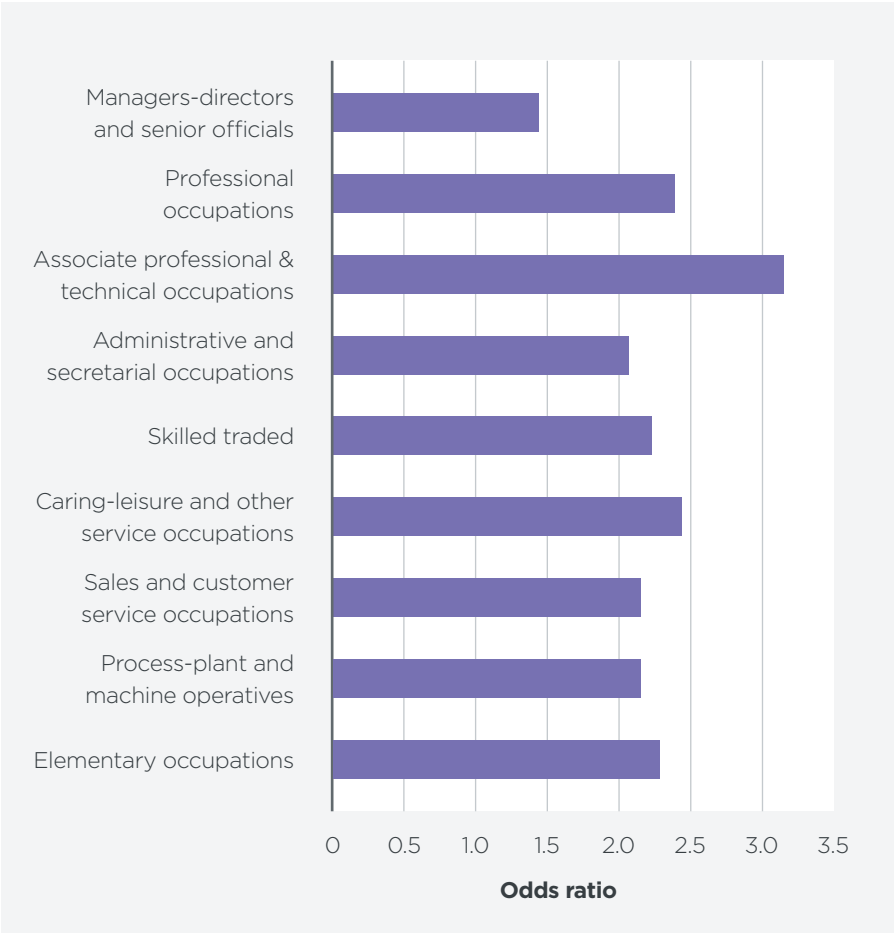
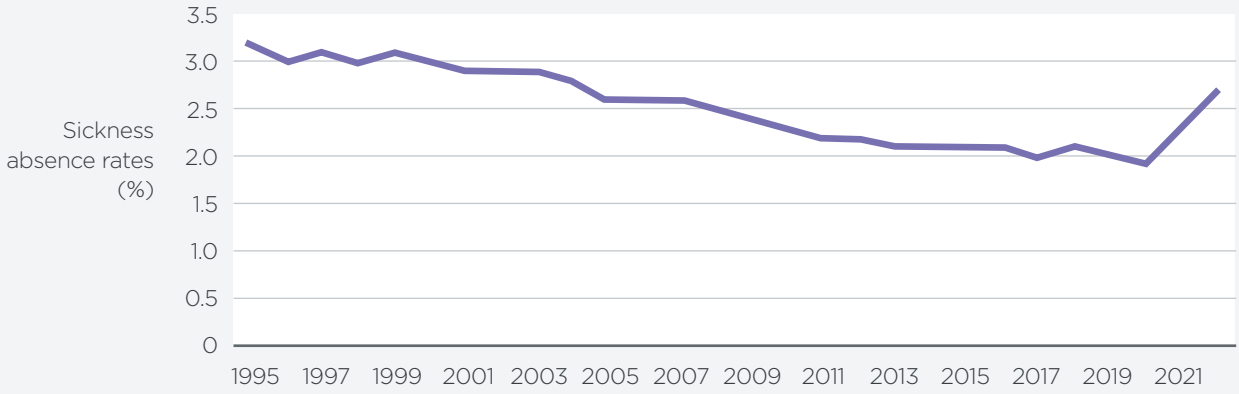


Figure 7. *(Opposite bottom) Odds ratio for increased sickness absence during the pandemic by occupational group (SOC).* (Data taken from Kromydas et al. (2022), data supplement 1.)

Figure 8. *Sickness absence rates for all people in employment aged 16 years and over, UK 1995 to 2022* (Office for National Statistics, 2023, licensed under **Open Government Licence v.3**)



COVID-19 survivors who experienced mental health symptoms report significant functional impairment and reduced quality of life comparable to patients after a stroke or a diagnosis of Parkinson's disease. The sickness absence rate rose from 1.8% in 2020 to 2.6% in 2021 after a downward trend since 1995, and COVID-19 illnesses accounted for 24.1% of sickness absences in 2021 (*Figure 8*). Aben et al. (2023) found delays in returning to work were closely associated with fatigue and sleep disturbance and were more prevalent in women, those of older age and those at high risk from SARS-CoV-2 infection.

Great uncertainty around future trends

There is considerable uncertainty about how the direct physical effects of COVID-19 will impact the mental health of the population and sickness absence rates in the future. Prevalences of symptoms such as fatigue and brain fog vary considerably between studies as a result of varying sample populations, sampling biases and metrics used. However, some studies suggest this could be as high as 60% of sufferers continuing to have symptoms nearly 18 months later (Ranucci et al., 2023).

In addition, there are indirect impacts of COVID-19 and the pandemic response. The mental health of children deteriorated during the pandemic (Atchison et al., 2023; Miall et al., 2023). Surprisingly, the biggest decline was seen in the most advantaged groups. What is unclear is how durable these harms will be, and whether this will translate to a generation of adults in the future with a higher prevalence of mental health problems and sickness absence. Trends in prevalence are difficult to determine given the variability in estimates across trials, but even taken at face value it is also uncertain what proportion of those individuals would have presented with mental health problems subsequently anyway. It is likely to take years of meticulous data collection to unravel the complexities of the problem.

References

Aben, B., Kok, R. and de Wind, A. (2023). Return-to-work rates and predictors of absence duration after COVID-19 over the course of the pandemic. *Scandinavian Journal of Work, Environment and Health,* 49(3): 182-92. **https://doi.org/10.5271/sjweh.4077**

Atchison, C., Whitaker, M., Donnelly, C., et al. (2023). Characteristics and predictors of persistent symptoms post-COVID-19 in children and young people: a large community cross-sectional study in England. *Archives of Disease in Childhood*, 108(7): e12. **https://doi.org/10.1136/archdischild-2022-325152**

Badenoch, J., Rengasamy, E., Watson, C., et al. (2022). Persistent neuropsychiatric symptoms after COVID-19: a systematic review and meta-analysis. *Brain Communications*, 4(1): fcab297. **https://doi.org/10.1093/braincomms/fcab297**

Bonazza, F., Luridiana Battistini, C., Fior, G., et al. (2022). Recovering from COVID-19: psychological sequelae and post-traumatic growth six months after discharge. *European Journal of Psychotraumatology,* 13(1): 2095133. **https://doi.org/10.1080/20008198.2022.2095133**

Bryan, M., Bryce, A. and Roberts, J. (2021). The effect of mental and physical health problems on sickness absence. *European Journal of Health Economics*, 22: 1519-33. **https://doi.org/10.1007/s10198-021-01379-w**

Cherrie, M., Rhodes, S., Wilkinson, J., et al. (2022). Longitudinal changes in proportionate mortality due to COVID-19 by occupation in England and Wales. *Scandinavian Journal of Work, Environment & Health,* 48(8): 611-620. **https://doi.org/10.5271/sjweh.4048**

Daly, M., Sutin, A. and Robinson, E. (2022). Longitudinal changes in mental health and the COVID-19 pandemic: evidence from the UK Household Longitudinal Study. *Psychological Medicine,* 52(13): 2549-58. **https://doi.org/10.1017/S0033291720004432**

Evans, R., McAuley, H., Harrison, E., et al. (2021). Physical, cognitive, and mental health impacts of COVID-19 after hospitalisation (PHOSP-COVID): a UK multicentre, prospective cohort study. *The Lancet Respiratory Medicine,* 9(11): 1275-87. **https://doi.org/10.1016/S2213-2600(21)00383-0**

Fernández-Castañeda, A., Lu, P., Geraghty, A., et al. (2022). Mild respiratory COVID can cause multi-lineage neural cell and myelin dysregulation. *Cell,* 185(14): 2452-2468.e16. **https://doi.org/10.1016/j.cell.2022.06.008**

Gao, X., Davillas, A. and Jones, A. (2022). The Covid-19 pandemic and its impact on socioeconomic inequality in psychological distress in the United Kingdom: an update. *Health Economics,* 31(5): 912-20. **https://doi.org/10.1002/hec.4480**

Gilleen, J., Santaolalla, A., Valdearenas, L., et al. (2021). Impact of the COVID-19 pandemic on the mental health and well-being of UK healthcare workers. *BJPsych Open*, 7(3): e88. **https://doi.org/10.1192/bjo.2021.42**

Global Burden of Disease Long COVID Collaborators (2022). Estimated global proportions of individuals with persistent fatigue, cognitive, and respiratory symptom clusters following symptomatic COVID-19 in 2020 and 2021. *Journal of the American Medical Association,* 328(16): 1604-1615. **https://doi.org/10.1001/jama.2022.18931**

Hastie, C., Lowe, D., McAuley, A., et al. (2023). Natural history of long-COVID in a nationwide, population cohort study. *Nature Communications*, 14: 3504. **https://doi.org/10.1038/s41467-023-39193-y**

Klein, R., Soung, A., Sissoko, C., et al. (2021). COVID-19 induces neuroinflammation and loss of hippocampal neurogenesis (preprint version 1). *Research Square.* **https://doi.org/10.21203/rs.3.rs-1031824/v1**

Kromydas, T., Green, M., Craig, P., et al. (2022). Comparing population-level mental health of UK workers before and during the COVID-19 pandemic: a longitudinal study using Understanding Society. *Journal of Epidemiology and Community Health,* 76(6): 527-36. **https://doi.org/10.1136/jech-2021-218561**

Lim, C., See, B., Liang Teo, D., et al. (2023). Risk perception and psychosocial impact during the early period of the COVID-19 pandemic on healthcare workers. *BJPsych Open*, 9(S1): S57-58. **https://doi.org/10.1192/bjo.2023.205**

McCurdy, C. and Murphy, L. (2024). We've only just begun: action to improve young people's mental health, education and employment. *Resolution Foundation.* 26 Feb. **https://www.resolutionfoundation.org/publications/weve-only-just-begun/** [Accessed 22 May 2024.]

Magnúsdóttir, I., Lovik, A., Unnarsdóttir, A., et al. (2022). Acute COVID-19 severity and mental health morbidity trajectories in patient populations of six nations: an observational study. *The Lancet Public Health,* 7(5): e406-16. **https://doi.org/10.1016/S2468-2667(22)00042-1**

Miall, N., Pearce, A., Moore, J., et al. (2023) Inequalities in children's mental health before and during the COVID-19 pandemic: findings from the UK Household Longitudinal Study. *Journal of Epidemiology and Community Health,* 77(12): 762-9. **https://doi.org/10.1136/jech-2022-220188**

Muccioli, L., Pensato, U., Cani, I., et al. (2020). COVID-19–associated encephalopathy and cytokine-mediated neuroinflammation. *Annals of Neurology,* 88(4): 860-1. **https://doi.org/10.1002/ana.25855**

Nagle, E., Šuriņa, S. and Griškēviča, I. (2023). Healthcare workers' moral distress during the COVID-19 pandemic: a scoping review. *Social Sciences,* 12(7): 371. **https://doi.org/10.3390/socsci12070371**

Nasserie, T., Hittle, M. and Goodman, S. (2021). Assessment of the frequency and variety of persistent symptoms among patients with COVID-19: a systematic review. *JAMA Network Open.* 4(5):e2111417. **https://doi.org/10.1001/jamanetworkopen.2021.11417**

NHS England (2023). *MDSHS monthly: time series data for selected MHSDS measures, April 2016 to Performance December 2023.* **https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-services-monthly-statistics/performance-december-2023**

Office for National Statistics (2021). *Percentage of adults with moderate to severe depressive symptoms, Great Britain, July 2019 to August 2021.* **https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/coronavirusanddepressioninadultsgreatbritain/julytoaugust2021** [Accessed 22 May 2024.]

Office for National Statistics (2023). *Sickness absence in the UK labour market, 2022.* **https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/labourproductivity/articles/sicknessabsenceinthelabourmarket/2022** [Accessed 22 May 2024.]

Ranucci, M., Baryshnikova, E., Anguissola, M., et al. (2023) The very long COVID: persistence of symptoms after 12–18 months from the onset of infection and hospitalization. *Journal of Clinical Medicine,* 12(5): 1915. **https://doi.org/10.3390/jcm12051915**

The Strategy Unit/NHS (2020). *Estimating the impacts of COVID-19 on mental health services in England: summary of results and methods.* **https://www.strategyunitwm.nhs.uk/sites/default/files/2020-11/Modelling%20covid-19%20%20MH%20services%20in%20England_20201109_v2.pdf** [Accessed 22 May 2024.]

UK Government (2022). *COVID-19 and occupational impacts.* **https://www.gov.uk/government/publications/covid-19-and-occupational-impacts** [Accessed 21 May 2024.]

Chris Martin

Chris Martin is a modeller, health informatician and former GP in the NHS. He has worked in a number of specialities including psychiatry, medicine, surgery, oncology, nephrology and obstetrics as well as general practice. After doing research in aspects of primary healthcare, he completed a Masters and then a PhD in Health Informatics with a focus on modelling mortality by cause of death. He initially began modelling morbidity and mortality for decision support in clinical practice but for the past decade has worked in longevity modelling for annuities.

Enduring challenges in maintaining a healthy NHS workforce

Stuart McDonald, Florence Ma and Lydia Dutton, LCP

The NHS is critical to the health of the UK population, and the health and well-being of NHS staff is critical to high-quality patient care (RCP, 2015; Hall et al., 2016). Ensuring a healthy NHS workforce is of ever-increasing importance, as the NHS continues to tackle the aftermath of the COVID-19 pandemic. With recent NHS waitlist consistently at highs in excess of 7.5 million patients, the burden on the workforce and the impact on delivering timely patient care are clear (LCP, 2024).

Although more focus is often placed on tangible metrics of NHS performance, such as A&E waiting times and cancer diagnostic targets, the success of the UK's largest employer ultimately depends upon the performance of its workforce and on the resources made available to them.

The latest NHS staff survey (NHS England, 2024a) contained some bleak findings – around half of doctors were dissatisfied with their day-to-day work, almost 70% of NHS workers felt underpaid, and, perhaps most worrying of all, almost a third of NHS staff felt close to burnout. Significant variation can be seen between job roles and geographic regions; there is clearly no one-size-fits-all solution.

Pressure has been exacerbated by the pandemic, with key indicators showing a marked deterioration in the mental health of NHS workers in recent years. Despite these findings, the 2023 survey showed a modest improvement from the 2022 edition. To have a prosperous NHS for generations to come, it needs to be an employer that people want to work for and can flourish within, with appropriate support where required.

In this article we explore the latest picture of wellbeing, some of the key mental health challenges faced by NHS workers and the potential ramifications for patient outcomes.

Understanding the mental health of NHS workers

Even before the pandemic there were concerns regarding the mental health of NHS workers. Boorman (2009) marked the growing recognition of the impact of work-related stress and mental health in the NHS.

In recent years, the NHS Staff Survey (first launched in 2003) has included questions to explore the mental health of workers. The 2023 survey, published in March 2024, received over 700,000 responses which makes it one of the largest workforce surveys in the world (NHS England, 2024a).

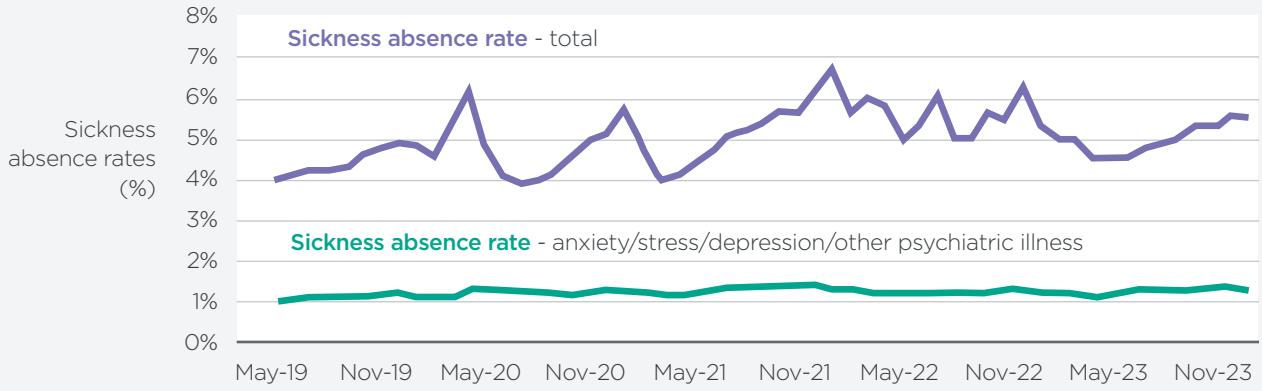
Similarly, GMC (2023) focuses on the workplace experiences of doctors up to 2022.

Absence rates

Mental health has consistently been the leading cause of NHS sickness absence, accounting for around a quarter of all sickness absences (NHS England, 2024b). Data from January 2024 shows that anxiety/stress/depression/other psychiatric illnesses was the most reported reason for sickness, accounting for over 587,100 full-time equivalent days lost, or 24% of all sickness absence. High overall absence rates add to the burden of insufficient staffing, potentially leading to a vicious spiral with those workers not absent needing to take on additional duties.

NHS England (2024a) notes that 42% of NHS staff reported feeling unwell because of work-related stress in the past year. This increased to around 45% over 2020–2022 but has now fallen back closer to the pre-pandemic rate of around 40% (seen in 2018 and 2019). While significant improvements since 2022 are observed amongst nursing and ambulance operational staff, the picture for medical and dental staff remains broadly unchanged. The results of GMC (2023) echo those of the NHS Staff Survey, with 22% of doctors reporting that they have taken a leave of absence due to stress in the last 12 months.

Figure 1. *NHS Sickness Absence Rates* (Source: NHS England, 2024b, licenced under **Open Government Licence v.3**)



Burnout

The NHS Staff Survey has shown consistently high and worrying scores for the proportion of staff experiencing burnout, albeit there was a modest improvement in 2023 compared to 2021 and 2022. Among occupations, ambulance operational workers experienced the highest rates of burnout. Over 2021 and 2022, around 50% of these workers reported feeling burnt out 'often' or 'always', with this improving to 42% in 2023. Across other occupations, 25–35% reported feeling burnt out 'often' or 'always' in the 2023 survey.

GMC (2023) notes that 40% of doctors reported feeling burnt out because of their work, to a 'high' or 'very high' degree. The survey used questions from the Copenhagen Burnout Inventory to assess burnout risk (Kristensen et al., 2005). These show that from the low point in 2020, possibly due to generally higher morale at the time, around 1-in-10 doctors were at high risk of burnout, and this has increased to 1-in-4 in 2022.

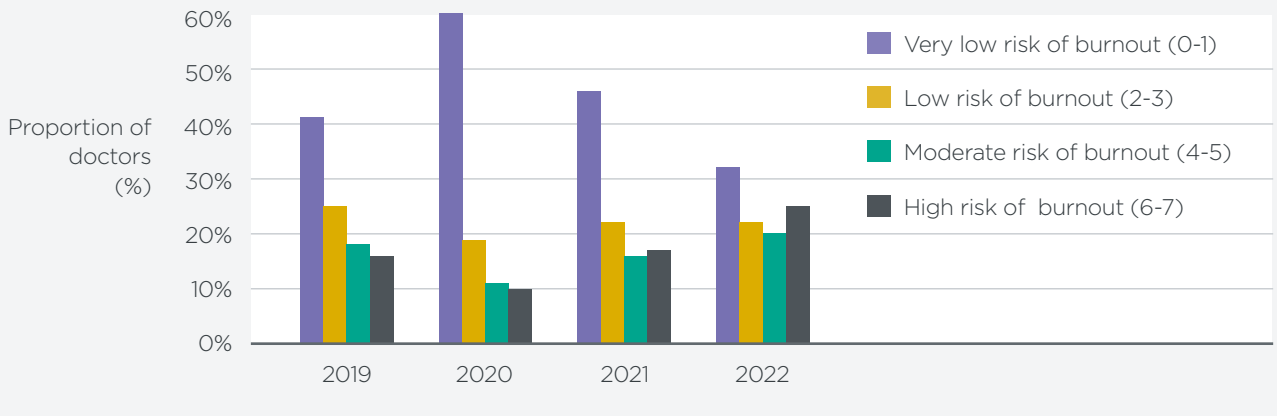
Figure 2. *Risk of burnout over time* (Thompson et al., 2023, fig. 4.3, reproduced with permission from the General Medical Council.)

Contributing Factors

Workload

The pandemic has intensified the workload and pressure on healthcare workers. Whilst the surveys are pointing towards working patterns gradually returning to where they once were, there is evidence that staff feel less able to cope with the demands.

GMC (2023) notes that 70% of doctors worked beyond their rostered hours at least once a week. This is an increase from that reported in 2021 (59%), but it is broadly in line with pre-pandemic levels (68% in 2019). While this might suggest workload levels are similar to pre-pandemic, it may be that the intensity of the workload has increased. This is highlighted by 42% of doctors reporting that they feel unable to cope with their workload on a weekly basis (compared to 30% in 2021, 19% in 2020, and 28% in 2019), and 68% of doctors reporting that at least once a week they find it difficult to take breaks due to the intensity of their workload (38% of which report this on a daily basis).



The NHS waiting list remains near its recent all-time high, driven by a backlog of patients not seen during the pandemic. The waiting list was already on a long-term increasing trajectory prior to the pandemic, and we are yet to see any evidence of substantial falls. The pace of work required to combat the waitlist not only exacerbates physical fatigue but also leads to severe mental strain, contributing to heightened levels of stress, anxiety, and an increased risk of burnout among medical professionals.

Pay and remuneration

The dissatisfaction with pay among NHS doctors, culminating in a number of high-profile strikes over the last year, has further compounded the challenges in staff wellbeing.

The NHS Staff Survey reports that 69% of workers were not satisfied with their pay in 2023, improved from 74% in 2022 but similar to 67% in 2021. There was a particularly marked increase in dissatisfaction for medical and dental staff – rising by over 20 percentage points from 45% in 2019 to 68% in 2023.

The underlying issues of pay dissatisfaction could be rooted in a sense of undervaluation within the profession, not just in financial compensation but also recognition and work-life balance. Such perceptions not only affect doctors' mental well-being but also can lead to a disconnection from their work, contributing to feelings of demoralisation and reduced job satisfaction. The downstream effects in staff retention and recruitment could create a vicious cycle that puts more pressure on remaining staff.

Other factors

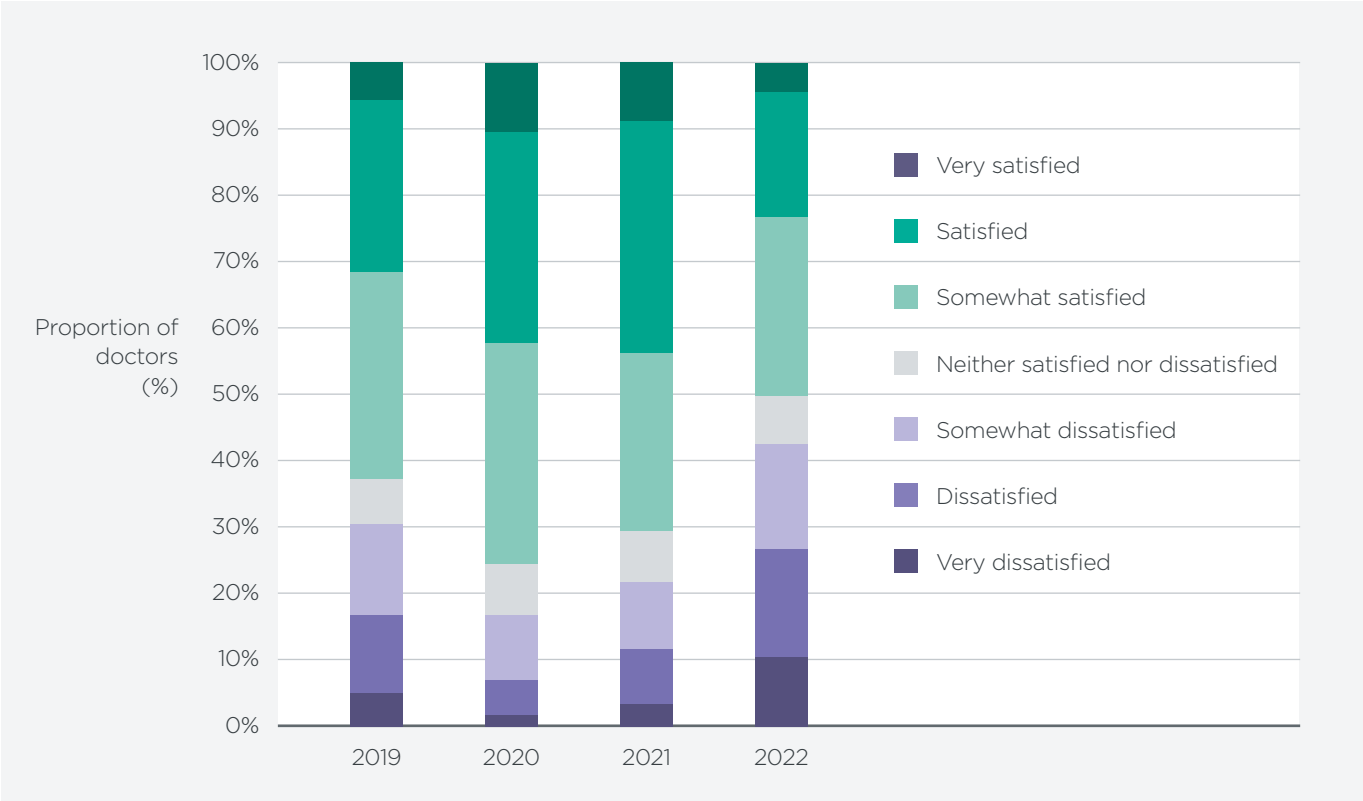
Whilst we have focused on the two major factors we believe contribute to the overall state of mental health within the NHS, there are, of course, a multitude of other contributing factors. These include, but are not limited to, staff shortages, treatment of staff by their colleagues, moral distress, etc.

Consequences

Employee satisfaction

While the pandemic was a difficult time for many of us, satisfaction amongst NHS workers was higher than it had been in 2019 – potentially boosted by widespread displays of public support. However, the aftermath appears to have taken a material toll on the mental health of healthcare workers. This was shown starkly by employee satisfaction figures. GMC (2023) showed that in 2020 and 2021 around 20% of doctors were dissatisfied with their everyday work. In 2022 this had increased to over 40%.

Figure 3. *Proportion of doctors' satisfaction with their day-to-day work* (Thompson et al., 2023, fig. 2.1, reproduced with permission from the General Medical Council.)



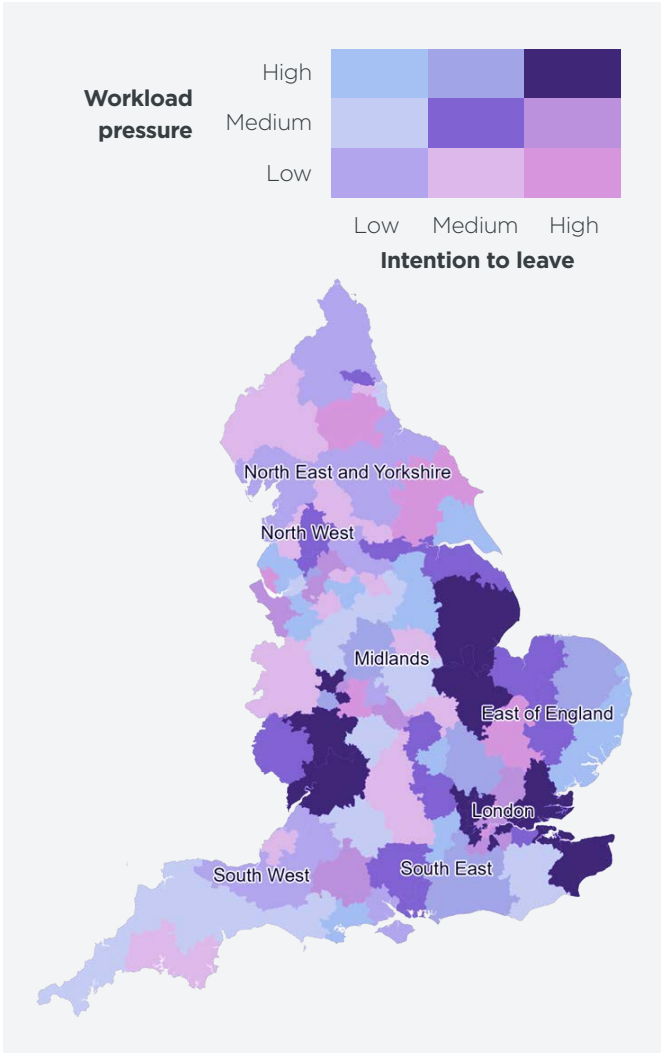
Vacancy rates and intention to leave

With rising levels of employee dissatisfaction, more employees are leaving or planning to leave the NHS workforce. Mental health challenges are likely to be a driver of staff turnover and recruitment efforts.

GMC (2023) notes that more doctors than ever before were likely to leave the UK profession (excluding retirees) with the 2022 survey showing 15% had taken concrete steps towards leaving, up from 7% in 2021. NHS England (2024a) shows that only a third of workers felt that there are enough staff at their organisation to enable them to do their jobs properly.

Earlier analysis by Tikhonovsky (2023) showed that intention to leave in 2022 among staff in NHS Acute Trusts paints a multifaceted picture. In 2023, this varied picture remains with trusts in areas such as London and the Midlands showing consistency in high workload pressure and high intention to leave, something that is not observed in other areas.

Figure 4. *Trust-level intention to leave and workload pressure* (Tikhonovsky, 2023, reproduced with permission)



Impact on patient care

Mental health issues can affect individual job performance (De Hert, 2020), quality of patient care (Grol et al., 1985; Haas et al., 2000), as well as overall operational efficiency of the NHS (NHS Employers, 2020). The NHS Staff Survey 2023 shows a similar level in confidence of patient care with 65%, compared to the 2021 and 2022 surveys (68% and 63% respectively), stating they would be happy with the standard of care provided by the NHS should friends or family require treatment. This is, though, a reduction from the pre-pandemic result of 72% (2019).

Cost of poor mental health

NHS Health Education England (2019) pointed out the cost of poor mental health in the NHS equates to £1,800–£2,200 per employee per year, highlighting the impact on NHS routine functions. Main drivers of financial costs include absence costs, presenteeism costs and costs due to deterioration in retention.

Conclusion

While we have largely focused on areas for improvement, the NHS has made some progress in creating a healthier working environment and raising awareness of staff well-being. NHS England (2024a) shows an increase in scores across multiple areas compared to 2022, such as access to learning and development opportunities, perceptions of teamwork and motivation. There is also a broadly similar picture in compassion and inclusivity, diversity and equality and flexible working.

The NHS workforce has had deteriorating satisfaction levels since the peak of the pandemic and is now doing worse than in 2019. In contrast to pre-pandemic times, there is now a higher workload with an unprecedented waiting list and more staff being absent from work or planning to leave. As pointed out by studies and perspective articles, organisational well-being initiatives, such as overhauling staff rotas and reducing meeting times, might be more effective than those targeted to individuals (Birkbeck, University of London, 2023; Oliver, 2024).

Mental health risks for healthcare workers prove to be multi-layered, with variations across occupation groups and geographical regions. In addition to creating a positive culture, the NHS will need to address structural issues that have downstream effects on mental health of the workforce and eventually the health of the nation.

References

Birkbeck, University of London (2023). *New report provides insights on how to support NHS staff wellbeing through organisational interventions.* 28 Mar. **https://www.bbk.ac.uk/news/new-report-provides-insights-on-how-to-support-nhs-staff-wellbeing-through-organisational-interventions** [Accessed 3 June 2024.]

Boorman, S. (2009). *NHS Health and well-being final report.* **https://webarchive.nationalarchives.gov.uk/ukgwa/20130124052412/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_108907.pdf** [Accessed 3 June 2024.]

De Hert, S. (2020). Burnout in healthcare workers: prevalence, impact and preventative strategies. *Local and Regional Anesthesia,* 13: 171-83. **https://doi.org/10.2147/LRA.S240564**

General Medical Council (GMC) (2023). *The state of medical education and practice in the UK: workplace experiences 2023.* **https://www.gmc-uk.org/-/media/documents/somep-workplace-experiences-2023-full-report_pdf-101653283.pdf** [Accessed 3 June 2024.]

Grol, R., Mokkink, H., Smits, A. et al. (1985). Work satisfaction of General Practitioners and the quality of patient care. *Family Practice,* 2(3): 128-35. **https://doi.org/10.1093/fampra/2.3.128**

Haas, J., Cook, E., Puopolo, A. et al. (2000). Is the professional satisfaction of General Internists associated with patient satisfaction? *Journal of General Internal Medicine*, 15(2): 122-8. **https://doi.org/10.1046/j.1525-1497.2000.02219.x**

Hall, L., Johnson, J., Watt, I. et al. (2016). Healthcare staff wellbeing, burnout, and patient safety: a systematic review. *PLoS One*, 11(7): e0159015. **https://doi.org/10.1371/journal.pone.0159015**

Kristensen, T., Borritz, M., Villadsen, E. and Christensen, K. (2005). The Copenhagen Burnout Inventory: a new tool for the assessment of burnout. *Work & Stress*, 19(3): 192-207. **https://doi.org/10.1080/02678370500297720**

Lane Clark & Peacock LLP (LCP) (2024). *Waiting list tracker*. **https://waitinglist.health.lcp.com/** [Accessed 3 June 2024.]

NHS Digital (2024). *NHS sickness absence rates.* **https://digital.nhs.uk/data-and-information/publications/statistical/nhs-sickness-absence-rates** [Accessed 3 June 2024.]

NHS Employers (2020). *Improving performance by improving staff wellbeing: North Bristol NHS Trust.* **https://www.nhsemployers.org/case-studies/improving-performance-improving-staff-wellbeing** [Accessed 3 June 2024.]

NHS England (2024a). *NHS Staff Survey*. **https://www.nhsstaffsurveys.com/** [Accessed 3 June 2024.]

NHS England (2024b). *NHS sickness absence rates, January 2024.* **https://digital.nhs.uk/data-and-information/publications/statistical/nhs-sickness-absence-rates/january-2024** [Accessed 24 June 2024.]

NHS Health Education England (2019). *NHS staff and learners' mental wellbeing commission report.* **https://www.hee.nhs.uk/sites/default/files/documents/NHS%20%28HEE%29%20-%20Mental%20Wellbeing%20Commission%20Report.pdf** [Accessed 3 June 2024.]

Oliver, D. (2024). Work wellness programmes aren't the key to improving NHS morale or retention. *British Medical Journal*, 384. **https://doi.org/10.1136/bmj.q224**

Royal College of Physicians (RCP) (2015). *Work and wellbeing in the NHS: why staff health matters to patient care.* **https://www.rcp.ac.uk/policy-and-campaigns/policy-documents/work-and-wellbeing-in-the-nhs-why-staff-health-matters-to-patient-care/** [Accessed 3 June 2024.]

Thompson, J., Kearney, I., Horsley, L., et al. (2023). *The state of medical education and practice (SoMEP) barometer 2022.* **https://www.gmc-uk.org/about/what-we-do-and-why/data-and-research/research-and-insight-archive/the-state-of-medical-education-and-practice-in-the-uk-barometer-survey-2022** [Accessed 3 June 2024.]

Tikhonovsky, N. (2023). *Burnt out or something more? Examining the real root cause of NHS workforce challenges.* **https://www.lcp.com/our-viewpoint/2023/04/burnt-out-or-something-more-examining-the-real-root-cause-of-nhs-workforce-challenges** [Accessed 3 June 2024.]

Stuart McDonald

Stuart McDonald is Head of Longevity and Demographic Insights and a partner in LCP's Actuarial team. He helps clients understand and manage the impact of mortality trends, leveraging insights from Health Analytics. He advises some of the UK's largest pension schemes as well as leading insurers and reinsurers. He is Deputy Chair of the Continuous Mortality Investigation (CMI) and founded the influential COVID-19 Actuaries Response Group. He was awarded an MBE for services to Public Health in the 2022 New Year Honours.

Florence Ma

Florence Ma is an analyst at LCP Health Analytics. Prior to this role, she practiced pharmacy for over seven years in public hospitals and the Department of Health in Hong Kong. Florence is a Board Certified Pharmacotherapy Specialist and holds a Master of Science in Health Data Science from the London School of Hygiene and Tropical Medicine, as well as a Master of Clinical Pharmacy from the University of Hong Kong.

Lydia Dutton

Lydia Dutton is an actuary and pensions consultant at LCP, with over seven years' consulting experience to trustees and sponsors of UK DB pension schemes. She has particular expertise in providing longevity advice, working as part of LCP's specialist mortality team to help keep their actuaries and clients informed of the latest developments and trends relating to life expectancies. Prior to her role at LCP, Lydia focused on mortality modelling research during her Master's degree at the University of Liverpool.

News from the Continuous Mortality Investigation (CMI)

Introduction

The CMI's work has continued to include analyses undertaken to help understand the impact of the pandemic, as well as our 'business as usual' investigation work.

This article outlines the following:

- The CMI's Centenary.
- The release of the latest CMI Mortality Projections Model, CMI_2023.
- An update on recent mortality in the general population of England and Wales.
- The release of the 'S4' series mortality base tables.
- Regular investigation work – mortality experience of pensioners, analysis of term assurances policies to 2022 and analysis of experience of pension annuities in payment in 2022.

CMI Centenary

The CMI Year 2024/25 is a particularly special year because 2024 marks one hundred years since the CMI began regularly collecting data.

The initiators of the CMI all those years ago were bold in their ambition to start something new. We continue to evolve the CMI's output today, with new analyses, measures and ways to access our work so that we fulfil the CMI's mission to produce high-quality impartial analysis for our users, which are often central to many actuaries' daily work.

A crucial element of the CMI's success and longevity is the contribution of volunteers, without which none of this would be possible. We look forward to what the second century brings.

CMI_2023

The Mortality Projections Committee published the latest version of the CMI Mortality Projections Model, CMI_2023, in April 2024. This was accompanied by:

- **Working Paper 188**, which summarises responses to the consultation on CMI_2023;
- **Working Paper 189**, which contains numerical results, commentary, analysis of recent mortality in the general population and illustrations of the sensitivity of the Model to new data; and
- **Frequently Asked Questions on CMI_2023**.

At the time of the consultation, we proposed weights of 10% for 2022 and 2023 data. However, the published version of CMI_2023 uses weights of 15% for 2022 and 2023, reflecting a small change in the balance of views within the Mortality Projections Committee in light of the consultation responses.

The standard version of CMI_2023 produces cohort life expectancies at age 65 that are about five weeks lower for males and two weeks lower for females than in CMI_2022.

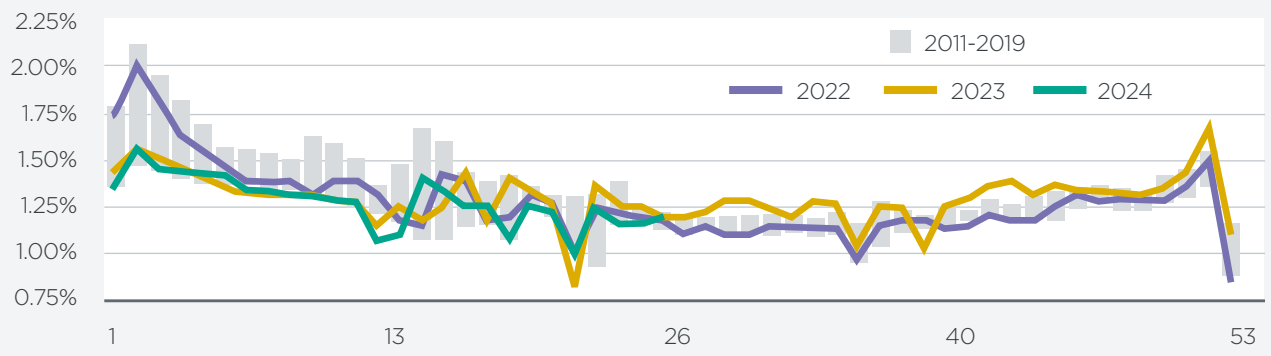
Mortality monitor

The Mortality Projections Committee continues to produce weekly updates to the **CMI mortality monitor**. The monitors for week 26 of 2024 and Q2 of 2024 cover data to 28 June 2024 and were published on 10 July 2024.

Figure 1 on the next page shows how weekly standardised mortality rates in England and Wales have developed in 2022, 2023, and 2024 compared to the range of weekly standardised mortality rates for 2011-2019.

Mortality to the end of week 26 of 2024 is 3.4% lower than the same period in 2023.

Figure 1. *Weekly standardised mortality rates in England & Wales for 2011-2019 and 2022-2024*



Final 'S4' Series mortality tables

The Self-Administered Pension Schemes (SAPS) Committee published the final 'S4' Series mortality tables alongside **Working Paper 185**.

The 'S4' tables are based on data for 2014 to 2019, to avoid years affected by the COVID-19 pandemic, and have an effective date of 1 January 2017. They include the first CMI tables for which mortality varies according to Index of Multiple Deprivation (IMD).

We described the dataset, graduation methods, and proposed 'S4' tables in detail in the consultation in **Working Paper 181**. As well as the final 'S4' rates, Working Paper 185 summarises the responses to the consultation and gives our thoughts on these.

Mortality experience of pensioners

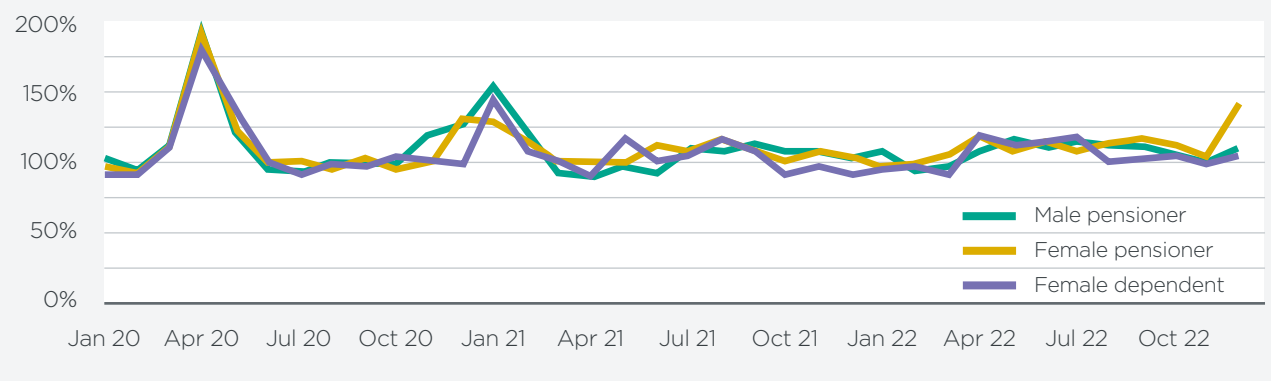
The SAPS Committee published **Working Paper 190** in April 2024. The paper investigates the mortality experience of pensioners over the period from 2015 to 2022. This is the first paper to be prepared following the publication of the 'S4' Series of mortality tables.

The analysis shows that:

- For most subsets of the data, mortality has been a little heavier than the projected 'S4' mortality rates. As we are including the relatively heavy calendar years 2020, 2021, and 2022 in this analysis, but excluded these years from the 'S4' tables; this is to be expected.
- For most groups, mortality tended to become lighter over the period to 2019 but was heavier in 2020, 2021, and 2022.
- Mortality shows sharp peaks in April 2020 and January 2021, corresponding broadly to the first and second waves of the COVID-19 pandemic. However, the increase in mortality between 2019 and 2020 appears to be lower for the SAPS dataset than in the general population.

Figure 2 below shows how monthly age-standardised mortality rates from 2020 onwards compare to those in the corresponding month in 2019.

Figure 2. *Ratio of 2020, 2021, and 2022 monthly age-standardised mortality rates to 2019*



Term assurances to 2022

The Assurances Committee published **Working Paper 191** in June 2024. The paper describes the experience of term assurances in 2022, with comparisons to 2016-2019, 2020 and 2021. Experience is considered both at an overall and by factors in the datasets, using the '16' Series term mortality and term accelerated critical illness tables (without allowances for trends) to calculate expected claims.

For the first time in an annual experience update paper, we consider:

- Claim type (death or terminal illness) for mortality benefits
- Cause of claim for accelerated critical illness benefits
- Experience by regions of the UK and by nation-specific Index of Multiple Deprivation (IMD) deciles (previously we have only been able to show experience by a UK-wide measure of IMD deciles due to the volumes of data received)

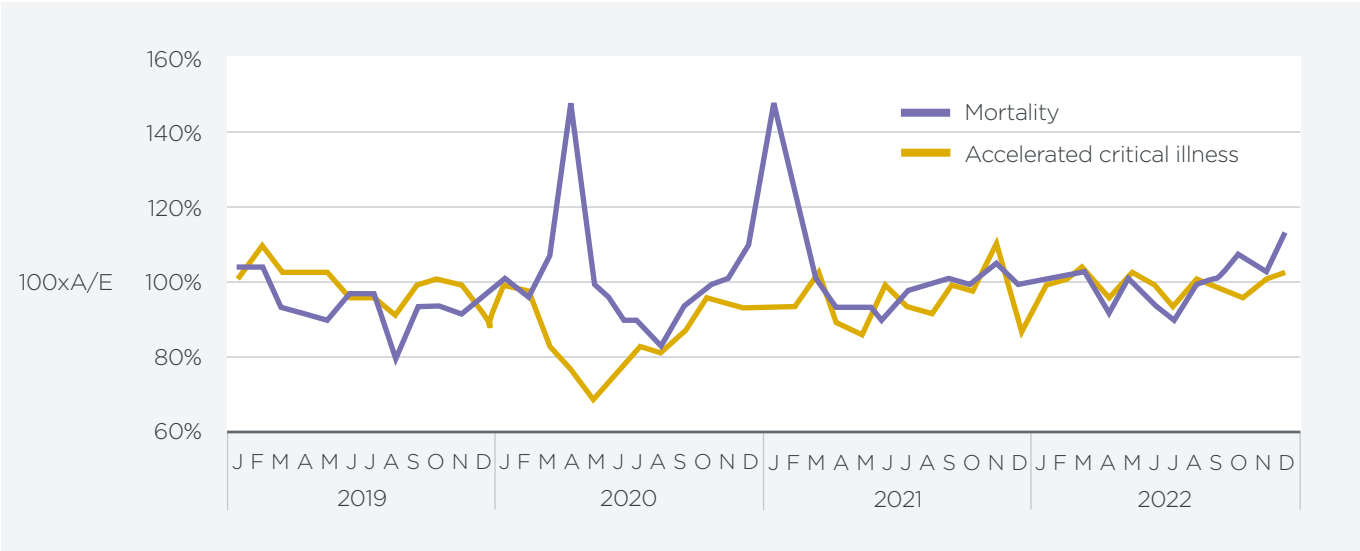
Our analysis shows:

- The experience of mortality benefits in 2022 is lighter than the expected basis for the first time since 2019. The level of mortality in 2022 is similar to that observed in 2017 but not quite as light as 2019. The revised experience of 2020 and 2021 data is 2% and 5% heavier than the expected basis, respectively.
- For mortality benefits, male and female non-smoker experience shows relatively heavy experience at older ages compared with younger ages in 2022 and in other recent years. Trends in experience for the smoker are less clear except for possible evidence of heavier experience at older ages in 2022 for male smokers. This suggests the age-shape of the '16' Series tables, which are based on 2015-2018 data, may not fit recent experience well.
- The experience of accelerated critical illness benefits is close to the expected basis in 2021 and 2022 (2% and 1% lower, respectively) except for female smokers in 2021 and male smokers in 2022, which have substantially lighter experience (but also less credibility due to lower data volumes). The 2020 experience is considerably lighter than the expected basis.

We have previously commented on experience by month during the pandemic. Our view of 2019 to 2021 has changed little in these new results. Considering patterns in experience in 2021 and 2022:

- Mortality experience is very similar to the expected basis between mid-2021 and early 2022. This coincides with a period of elevated COVID-19 deaths in the general population. Experience thereafter in 2022 falls but rises towards the end of the year. Again, this is consistent with a period of higher deaths in the general population. This feature appears to arise from a combination of heavier experience across all gender and smoker status subsets, although we note experience in these months is subject to greater uncertainty.
- Accelerated critical illness experience is more erratic in 2021 compared with other years but relatively stable around 100% of the expected basis in 2022. These features are evident in both non-smoker subsets but the experience of the smoker subsets is more erratic.

Figure 3. *100 x Actual / Expected values by month*



Experience of pension annuities in payment in 2022

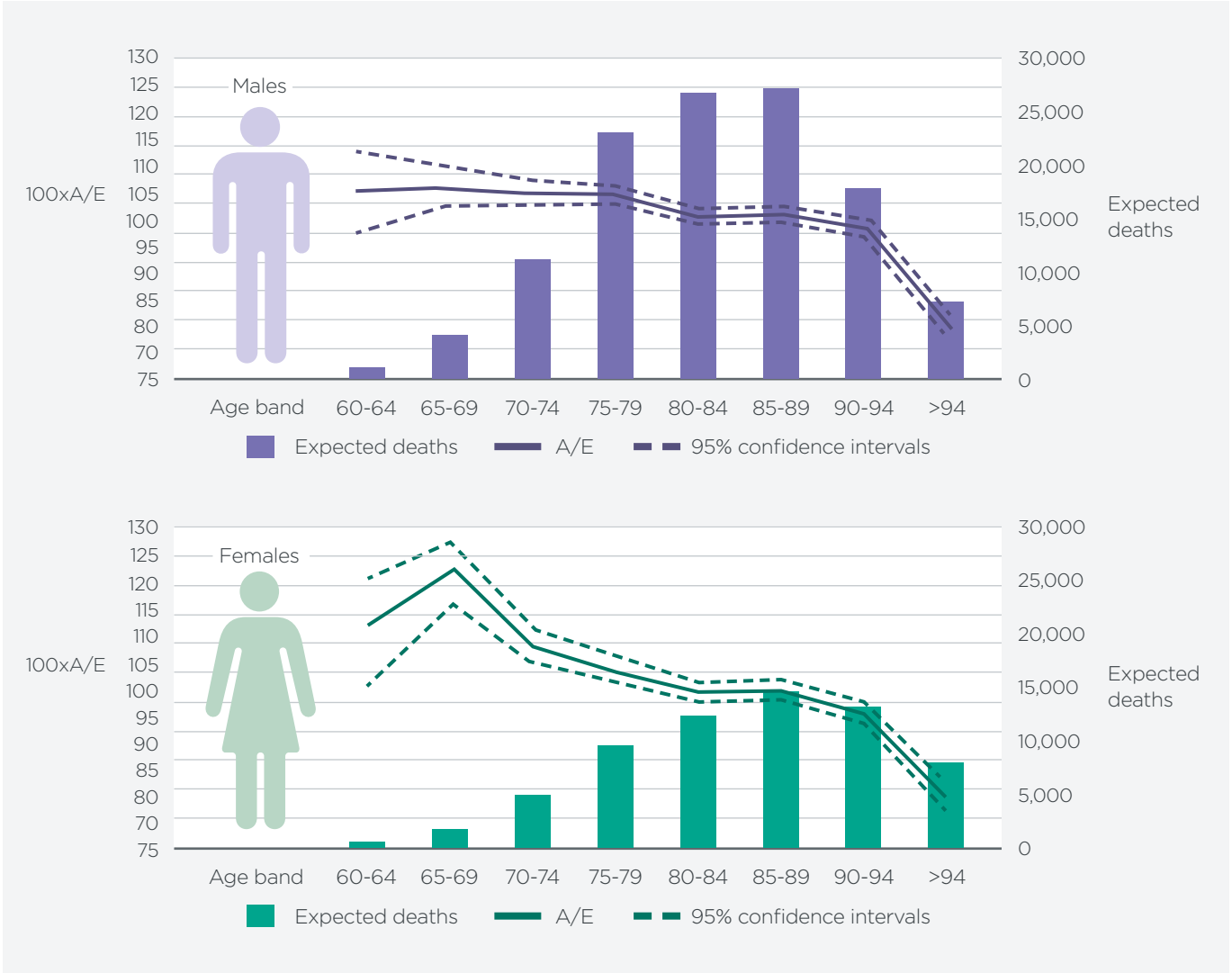
The Annuities Committee published **Working Paper 186** in February 2024. The paper describes the experience of pension annuities in payment in 2022, including some comparisons to experience in 2016-2019, 2020 and 2021.

Values underlying charts, datasheets and a Tableau workbook, allowing interactive exploration of selected charts are available as accompanying outputs.

The analyses show that:

- For males, experience in 2022 is generally heavier than the projected '16' Series tables, with a downward shape by age band, on both a lives-weighted basis and, to a lesser extent, on amounts basis. Experience is 8% heavier than the projected tables at age band 65-69 and falling to be 1% heavier than the projected '16' Series tables for age band 90-94.
- For females, lives-weighted experience in 2022 is heavier than the projected '16' Series tables overall but lighter on amounts basis. Experience for females is 9% heavier in the 70-74 age band and falls to 2% lighter than the projected '16' Series tables in the 90-94 age band.
- Average mortality improvements over 2015-2019 are lower in the annuities dataset than improvements in the population for males, when experience is expressed as Standardised Mortality Rates (SMRs). For females, average mortality improvements over 2015-2019 are higher than for the population.
- For both males and females, mortality improvements in 2020 and 2021 are higher in the annuities dataset than the population, but in 2022 they have been lower. There is, however, greater uncertainty in the results for 2022, primarily due to uplifts made to allow for late reporting of deaths.

Figure 4. *Lives-weighted 100 x actual/expected and expected deaths by age band for the 2022 dataset*



Staying up to date with mortality, longevity and morbidity

Michael Anderson, Deputy Editor, *Longevity Bulletin*

The *Longevity Bulletin* is published on behalf of the Mortality Research Steering Committee (MRSC), with a broad remit covering mortality, longevity and morbidity. While the *Bulletin* is at present usually published annually, readers may wish to stay more engaged with the latest thinking and developments in these areas. There are a range of different ways of doing so, apart from the CMI, and further information is provided below for reference.

Longevity, mortality and morbidity community

There are a number of groups now active on the IFoA communities website, one of which focuses on topics related to mortality and morbidity. This community provides a virtual forum for posting thoughts and comments, exchanging and debating ideas and sharing sources of useful information on relevant topics. This is a fairly recent addition to the overall communities site and so readers may be less aware of its existence. The aim is to share information and ideas, discuss the latest developments in the field and debate the key topics that practitioners are grappling with in endeavouring to set assumptions and measure longevity mortality and morbidity risk. There has arguably never been a more interesting and challenging time to be seeking to understand and project how mortality and morbidity will evolve in future. Fascinating conversation and debate should be expected.

> The community welcomes new contributors and can be found at **https://communities.actuaries.org.uk/communities/longevity-mortality-and-morbidity/**

Mortality Research Steering Committee

The MRSC directs and carries out research into mortality and morbidity topics with the aim of furthering understanding within the profession relating to these topics. A recent example is the project to compile a rich database of cause of death data for the UK, which will be published this year by the CMI. This data will allow a more detailed exploration of causes of death, by including secondary contributing causes that add more information about comorbidities and wider patterns in mortality experience. The data has also been grouped into drivers, that will allow for a deeper analysis of the factors influencing trends in mortality.

Research has also been carried out together with Bupa in respect of the factors affecting duration of stay and the mortality of residents of Bupa care homes and will be published in the ***British Actuarial Journal*** later this year.

The committee meets regularly to set priorities and discuss progress on current initiatives. Vacancies become available from time to time as some members reach term limits; these are advertised on the **IFoA vacancies site**. Volunteers for research projects are also always gratefully welcomed and can contact the committee via the member interest group.

Longevity and Mortality Actuaries Member Interest Group (MIG)

The MiG operates under the auspices of the MRSC and is chiefly responsible for keeping longevity and mortality actuaries up to date with the latest developments and thinking in the field and acting as the key public interface for the MRSC. This currently takes the form of arranging webinars and other events, which involves generating ideas for webinar themes, engaging with speakers and managing the technical aspects of hosting the webinar. Recordings of previous webinars are available at **https://www.lmaforum.org.uk/our-webinars**. The MiG also leads on sharing information through public forums such as LinkedIn (**www.linkedin.com/company/lmaforumuk**) and on the Longevity, Mortality and Morbidity IFoA community. The group meets fortnightly on a Tuesday and is always on the lookout for new members with fresh ideas and enthusiasm. Anyone interested in joining should contact Caroline Roberts or Dan Ryan.

Beijing
Room 512 · 5/F Block A · Landgentbldg Center · No. 20 East Middle 3rd Ring Road
Chaoyang District · Beijing · 100022 · People's Republic of China
Tel: +86 (10) 6611 6828

Edinburgh
Spaces · One Lochrin Square · 92 Fountainbridge · Edinburgh · EH3 9QA
Tel: +44 (0) 207 632 2100

London (registered office)
1-3 Staple Inn Hall · High Holborn · London · WC1V 7QJ
Tel: +44 (0) 207 632 2100

Malaysia
Arcc Spaces · Level 30 · Vancouver suite · The Gardens North Tower
Lingkaran Syed Putra · 59200 Kuala Lumpur
Tel: +60 12 591 3032

Oxford
Belsyre Court · 1st Floor · 57 Woodstock Road · Oxford · OX2 6HJ
Tel: +44 (0) 207 632 2100

Singapore
Pacific Tech Centre · 1 Jln Kilang Timor · #06-01 · Singapore · 159303
Tel: +65 8778 1784

actuaries.org.uk