



Sleepio in the Thames Valley

Scaling digital Cognitive Behavioural Therapy (CBT) for insomnia with the NHS



Contents

04	Sleepio & the Oxford AHSN
06	Executive Summary
08	Challenge
14	Opportunity
22	Engagement & Outcomes
26	Cost Savings
28	Feedback
38	References

FOREWORD FROM THE OXFORD ACADEMIC HEALTH SCIENCE NETWORK (AHSN)

In October 2018, the Oxford AHSN and Big Health came together to assess whether Sleepio - a digital CBT programme for insomnia - could bridge the treatment gap for insomnia in primary care. Fast forward to today, and over 7,000 people have accessed evidence-based CBT for insomnia and poor sleep.

This report represents a rich set of learnings for innovators and NHS systems on how a fully automated digital solution can be successfully implemented at scale. We believe this project represents innovation at its best, benefiting patients, clinicians, and commissioners alike. The NHS has shown that where there is the willingness and capacity to innovate, truly extraordinary feats can be achieved; all the more important in these challenging times.

As we approach the completion of this project, we believe it is time for tried and tested innovations like Sleepio to be routinely adopted in the NHS, and embedded in commissioning and service delivery across the country. In this way, the very purpose of the AHSN Network - “transforming lives through healthcare innovation” - can result in millions of people getting access to solutions that really work, while at the same time offering cost savings to the NHS.

We would like to thank all the stakeholders who have come together to make this project such a success and in particular, we are grateful to Innovate UK for their funding and ongoing support. The results documented in this report are a testament to the collaboration and dedication of countless individuals and groups across the patch, and we are truly grateful for their support.



Tracey Marriott
Director of Clinical Innovation Adoption,
Oxford AHSN

Sleepio & the Oxford AHSN in the Thames Valley

In October 2018, Big Health - the company behind Sleepio - partnered with the Oxford AHSN to tackle poor mental health with digital Cognitive Behavioural Therapy (CBT) at scale. The project was funded by Innovate UK as part of the Digital Health Technology Catalyst programme.

About the Oxford AHSN

The Oxford AHSN gets innovation into clinical practice to improve patient safety, outcomes and experience, and generate economic growth through collaboration between the NHS, industry and universities. It is part of the national AHSN network, linked into a unique collaborative of expertise and experience, sharing learning, pooling intelligence, and benefitting from a pipeline of emerging and proven solutions from around the country.

England's 15 AHSNs were set up by NHS England in 2013 and were relicensed from April 2018 to operate as the key innovation arm of the NHS.

About Big Health & Sleepio

Big Health is the company behind Sleepio - digital CBT for insomnia. Sleepio is the only provider of fully automated CBT, which is recommended as the first-line treatment for insomnia by the National Institute for Health and Care Excellence (NICE. See NICE CKS, 2020).

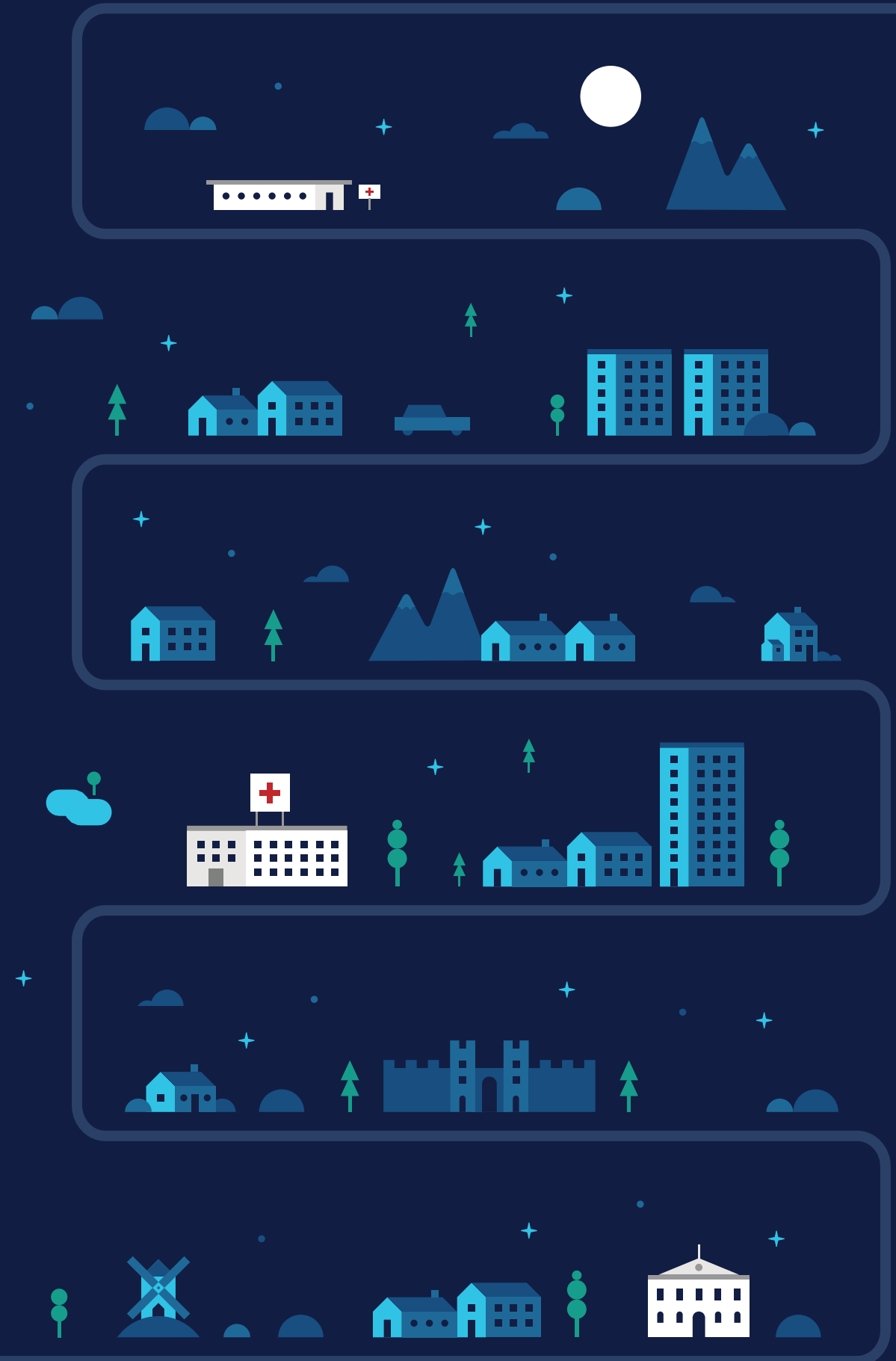
Sleepio is highly evidence-based, backed by 12 Randomised Controlled Trials, real-world outcomes in over 100k UK users, and independent health economics research.

Together, Big Health and the Oxford AHSN aimed to test whether Sleepio was feasible and effective at scale.



Big Health

Sleepio



Executive Summary

1. Challenge

The treatment gap for insomnia is dangerous and costly.

Insomnia is the most common mental health complaint in the UK, yet with just 1 CBT therapist for every 1,000 people living with insomnia, millions cannot access the NICE-recommended, first-line treatment: Cognitive Behavioural Therapy (CBT) for insomnia.

2. Opportunity

Could the NHS bridge the treatment gap with Sleepio, evidence-based digital CBT for insomnia?

The Oxford AHSN and the NHS chose Sleepio to provide digital CBT for insomnia because it is safe, effective, standardised, and scalable.

Sleepio was embedded in primary care and Improving Access to Psychological Therapies (IAPT) services, where it was offered alongside IAPT treatment. People could also self-refer without clinician involvement or gain access via their employer. No additional NHS hires were required.

3. Engagement & Clinical Outcomes

Sleepio resulted in strong engagement, improved insomnia recovery rates, and better all-round mental health.

Over 16,000 people accessed Sleepio, with over 7,000 progressing to CBT treatment via the programme.

On average, Sleepio patients living with insomnia had a recovery rate of 56% (n=2,174) and reported improvements in broader mental health and wellbeing.

4. Cost Savings

Independent health economics analysis shows that Sleepio saves money by reducing GP appointments and prescription costs.

The Office of Health Economics studied Sleepio's impact on primary care costs in 9 GP practices.

Introducing Sleepio resulted in a projected cost saving of £1.8m in three years when scaled across Buckinghamshire, Oxfordshire and Berkshire West Integrated Care System (BOB ICS)

5. Feedback

Patients, clinicians and commissioners told us how Sleepio had improved healthcare in the Thames Valley.

Big Health heard from thousands of patients and a wide range of NHS clinicians and commissioners. They described what it means to finally have access to gold-standard CBT for insomnia - and how it has changed their lives and practice for the better.

If you would like to provide thousands of people with instant access to clinically-evidenced, cost-effective digital CBT, please email

will.goddard@bighealth.com



The treatment gap for insomnia is dangerous and costly

Insomnia and poor sleep are the most common mental health complaints in the UK. Approximately 8-12% of adults suffer from chronic insomnia and 30-50% experience insomnia symptoms.¹

By comparison, the prevalence of anxiety is c. 6% and of depression is c. 3%.²

~8-12%

of adults suffer from chronic insomnia

30-50%

of adults experience insomnia symptoms

Insomnia is extremely harmful for both mental and physical health.

We all know how poor sleep makes us feel - groggy, irritable, unable to concentrate. However, the impact of chronic insomnia is far more damaging. Left untreated, it has a damaging impact on physical and mental health.^{3, 4, 5, 6}

60%
Increased Risk of Obesity

DEPRESSION

10x

Increased Risk

ANXIETY

17x

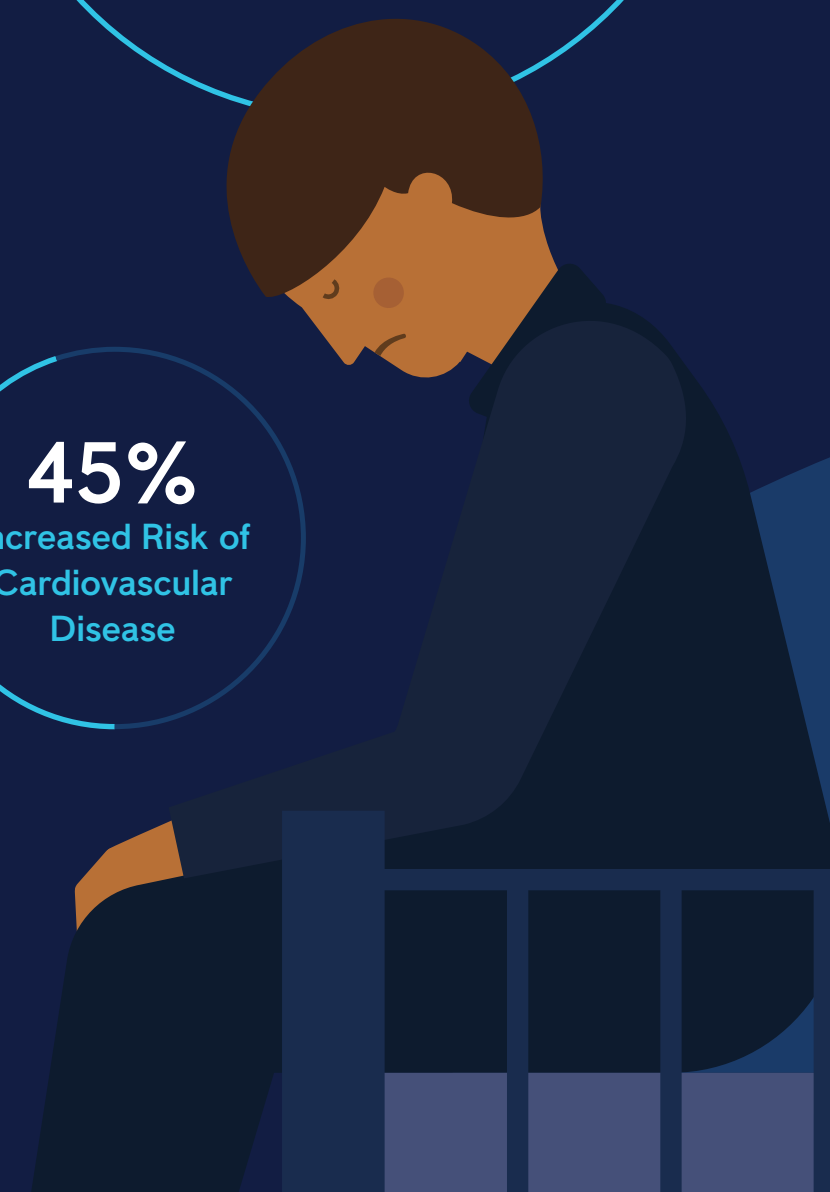
Increased Risk

45%

Increased Risk of Cardiovascular Disease

65%

Increased Risk of Diabetes



Despite this, millions of people every year are unable to access the treatment they need.

NICE recommends CBT for insomnia as the first-line treatment for insomnia, yet availability across the country is extremely limited due to a shortfall of qualified staff. There is only 1 CBT therapist available for every c. 1,000 people living with the condition - and the vast majority of these therapists are not specifically trained to treat insomnia.⁷

Training and hiring more staff may help, but is not a sustainable or scalable solution.

A conventional workforce will take too long to build and be too costly to bridge the treatment gap. Moreover, traditional in-person delivery is less able to cope with sudden peaks in need. This is particularly relevant in the wake of the Covid-19 pandemic, which experts expect will produce a wave of increased demand on mental health services. In particular, sales of prescription antidepressants and psychostimulants in March 2020 were 48% higher than the same month in 2019.⁸

“There is only 1 CBT therapist available for every c.1,000 people living with the condition”

What does the treatment gap mean for patients?

Without access to CBT for insomnia, patients either resort to self-medication or go without treatment altogether.

Self-medication can lead to an overdependence on harmful sleeping medication, which Public Health England highlighted in its 2019 evidence review: *Dependence and withdrawal associated with some prescribed medicines.*⁹

Alternatively, people may turn to alcohol and caffeine, which worsen sleep quality, or over-the-counter sleeping aids, which are not evidence-based treatments for insomnia and can cause significant distress for patients as their condition worsens.

In either case, patients suffer without CBT for insomnia.

What is the impact on commissioners and the wider system?

We know that when insomnia goes untreated, people are more likely to develop serious mental and physical health conditions, including an increased risk of suicidality.^{10,11}

Without access to CBT for insomnia as an early intervention, the system cannot take a preventative approach to these challenges. As a result, people's health needs become more complex and they require more comprehensive treatment - resulting in a larger clinical and financial burden downstream.

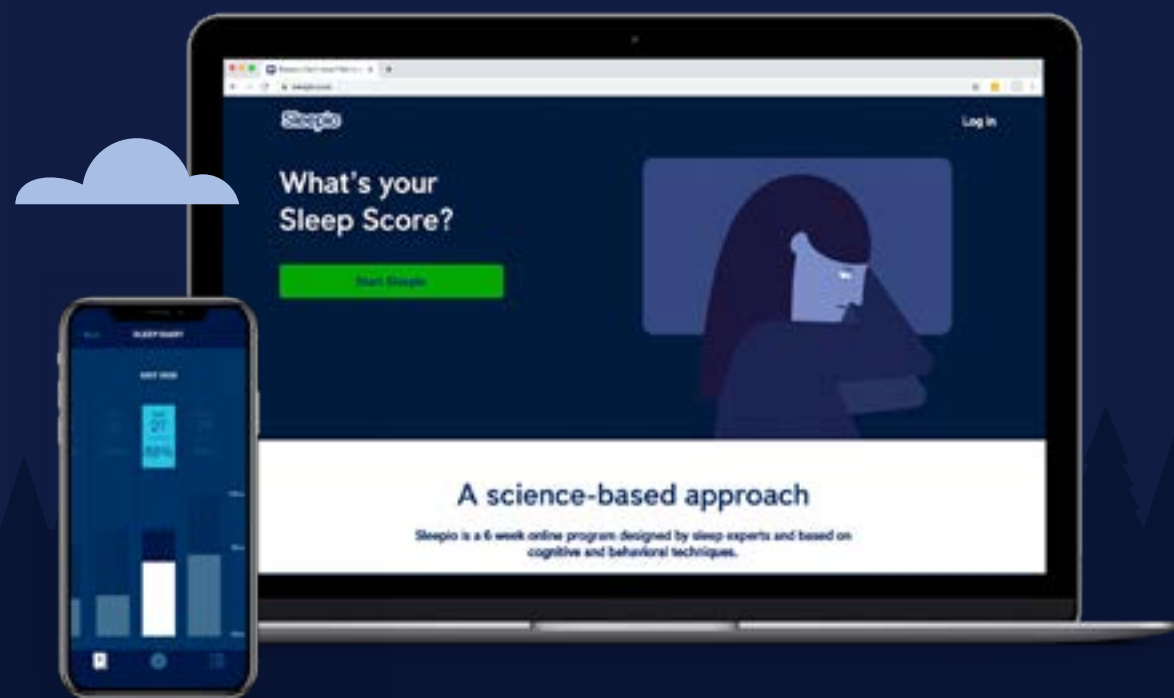
The current treatment gap harms patients and costs the NHS money.

Sleepio can bridge the gap with evidence-based digital CBT for insomnia, available at scale.

Bridging the treatment gap with Sleepio, digital CBT for insomnia

In October 2018, Big Health partnered with the Oxford AHSN to engage with Buckinghamshire CCG, Berkshire West CCG, Oxfordshire CCG, Milton Keynes CCG, Innovate UK and a wide range of system stakeholders - including local councils, third-sector organisations and employers - to test whether Sleepio could bridge the treatment gap for insomnia across the Thames Valley.





The first step of the Sleepio programme is taking the Sleep Survey on a laptop or desktop computer. Later in the programme, patients record their progress by filling in the programme's sleep diary.

Challenge

Opportunity

Engagement
& Outcomes

Cost
Savings

Feedback

Why Sleepio?

There were four key reasons why Sleepio was chosen for the project

1. Safe

Validated by NICE and approved by NHS Digital

Backed by robust clinical governance and safeguarding, with no adverse events reported in clinical trials

2. Effective

12 RCTs demonstrating effectiveness in insomnia, anxiety, depression

Proven to be effective in adults, young adults, and pregnant women

3. Standardised

Eliminates unwarranted clinical variation

Helps address existing 'postcode lottery'

4. Scalable

Provides instant access to CBT with zero waiting times

Offers commissioners unlimited capacity & ability to cope with unpredictable peaks in demand

Distribution at Scale

To reach thousands in need, we engaged with system stakeholders across four key distribution channels. No additional clinical staff were required to implement Sleepio across the region.

Below is a high-level summary of our activities within each channel. If you wish to receive more detailed information on implementing Sleepio, please email will.goddard@bighealth.com to receive a comprehensive Implementation Toolkit developed by Big Health and the Oxford AHSN, which provides practical guidance on each of the channels below.

CHANNEL

HOW WE DID IT

Primary Care

Collaborated with IAPT Service Leads and primary care practice teams to embed Sleepio into clinical workflows, including:

- Adapting the IAPT protocol to offer Sleepio alongside IAPT treatment
- Hands-on training to educate staff on insomnia and how to refer patients to Sleepio
- Integration into EMIS and PCMIS systems

Provided digital resources and printed materials to support staff and engage patients

Improving Access to Psychological Therapies (IAPT)

CHANNEL

HOW WE DID IT

Self-referral

Residents could self-refer to Sleepio in the community by visiting the Sleepio website directly - without the need for clinician involvement

Enabled easier access to care and supported a broader shift towards greater self-management

Sleepio access promoted locally via public health and third-sector organisations, local councils, and NHS trusts

Employers

Sleepio access promoted to staff in large local employers by Wellbeing Officers

Provided template digital and printed resources to help raise awareness of Sleepio access

Supported the self-referral channel as another way to access Sleepio without clinician involvement

Measuring Success

Four core measures were identified to assess whether Sleepio had successfully bridged the treatment gap.

Sleepio captures data entered by patients as they progress through the treatment, using a combination of clinically validated questionnaires and Patient Reported Outcome Measures (PROMs).

This data enabled Big Health to track performance against these four measures and report back to the Oxford AHSN on a quarterly basis.

Engagement

Will patients use Sleepio?

Will clinicians refer patients to Sleepio?

Feedback

Will patients find Sleepio beneficial?

Will clinicians think it is a worthwhile treatment?

Clinical Outcomes

Will patients recover from insomnia after using Sleepio?

Will their symptoms of anxiety and depression improve?

Financial Outcomes

Will Sleepio deliver financial benefits to the system?

If so, how significant will they be and where will they accrue?



Strong engagement among patients and clinicians

16,695

Registered patients who took Sleepio's 'Sleep Test'

7,078

Patients who began Sleepio's digital CBT programme

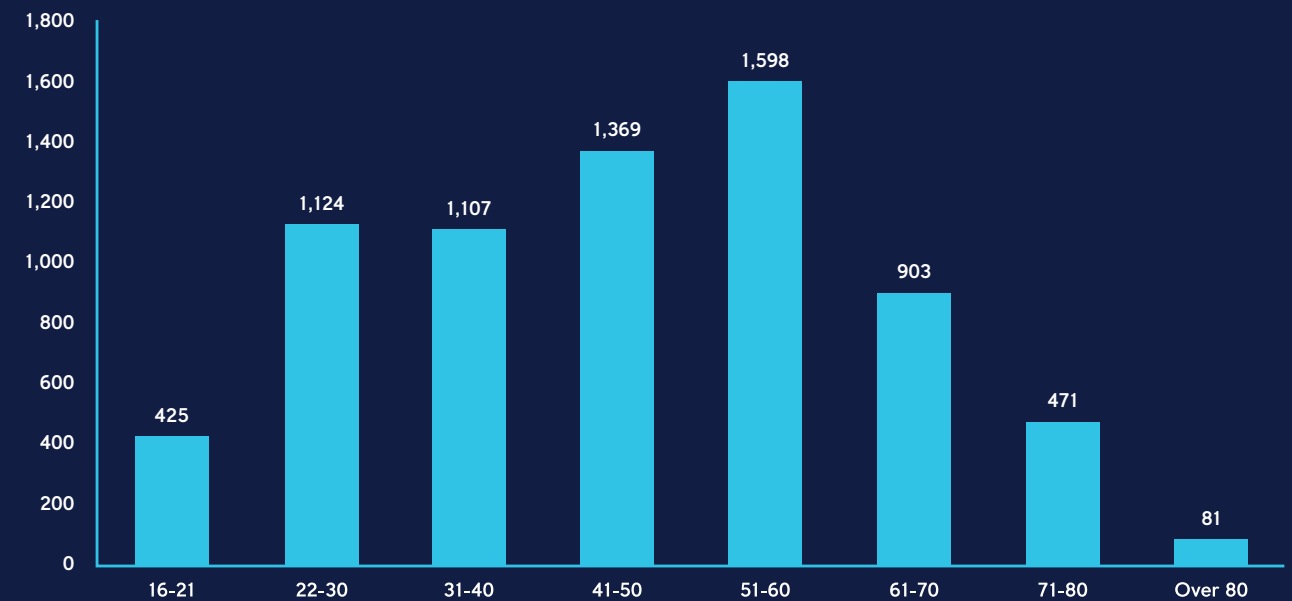
981

Registrations via Health Minds Bucks IAPT service

19

GP practices actively prescribing Sleepio

Patients starting Sleepio digital CBT treatment Oct 2018 - Jun 2020, by age group

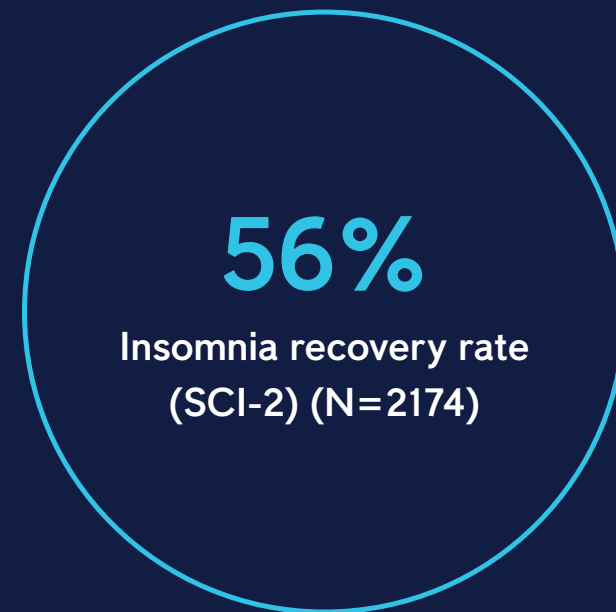


Addressing sleep improves all-round mental health

Big Health has analysed data across all Sleepio patients receiving CBT treatment to deliver a clinical outcomes report to the Oxford AHSN, NHS commissioners, and system partners.

The results demonstrate that Sleepio had a significant positive impact on mental health in several key areas - including a recovery rate for those living with insomnia of 56% (N=2047).

Big Health will be publishing additional data on its clinical outcomes in 2020, including an in-depth study of Sleepio's impact in Buckinghamshire's Healthy Minds Bucks IAPT service.



70%

Reduction in # patients screening positive for anxiety (GAD-2) (N=334)

72%

Reduction in # patients screening positive for depression (PHQ-2) (N=298)

56%

Reduction in usage of prescription medication and over-the-counter sleep aids (N=871)

21%

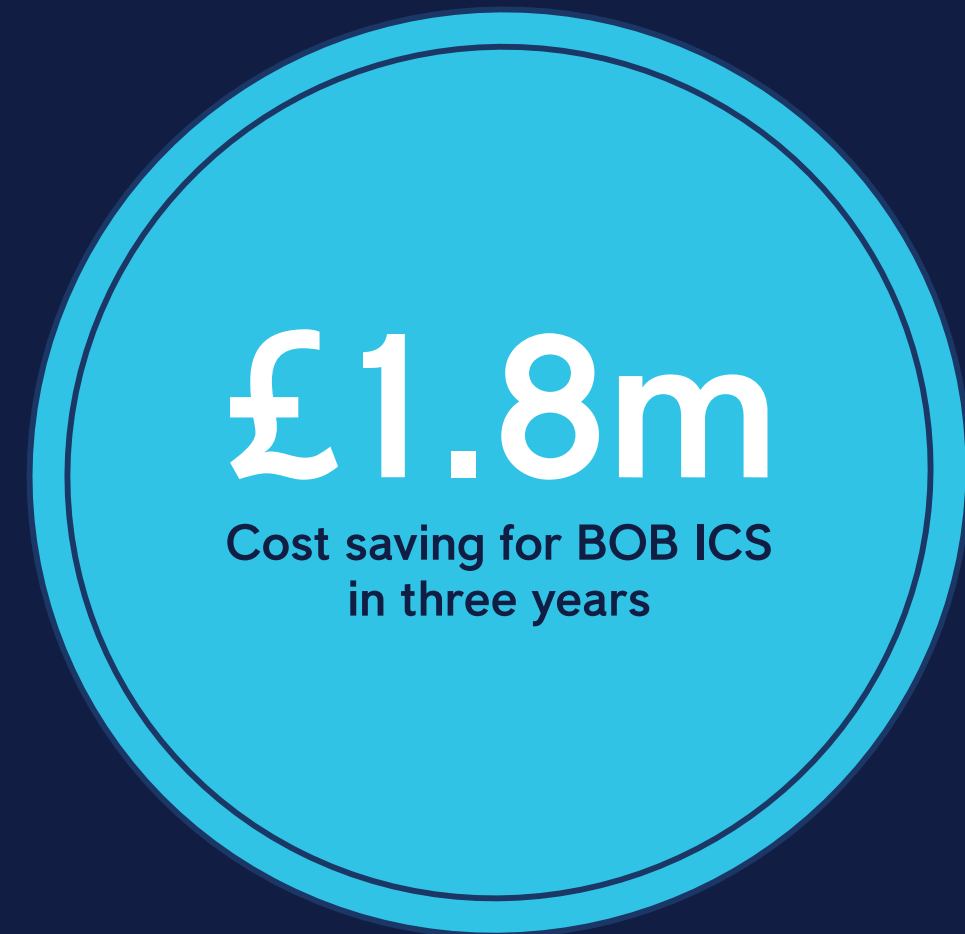
Reduction in absenteeism (N=1130)



The Study

The Office of Health Economics (OHE) conducted an independent health economics evaluation of Sleepio across 9 GP Practices in the Thames Valley over a 15-month period.

All 9 GP practices consistently referred patients to Sleepio. Sleepio was also available in IAPT services alongside IAPT treatment, and immediately accessible via self-referral in the community and local employers without the need for clinician involvement.



The Results

Based on Sleepio uptake data, 1,235 patients began Sleepio CBT treatment within the study sample.

Sleepio resulted in significant cost savings, projected to reach £130,803 in the sample in three years. This represents savings of £1.8m across Buckinghamshire, Oxfordshire and Berkshire West ICS - an implied saving of £106 per patient entering CBT treatment.

Sleepio therefore enables commissioners to adhere to NICE guidelines and to improve quality of care, while successfully operating in challenging financial conditions.



Patient Case Study

“Sleepio is the only thing that has made a real and lasting improvement to my sleep.”



Peter, 40
IT Manager in Oxfordshire

Peter had suffered from poor sleep for 20 years, feeling tired and irritable throughout the day. He sought advice from his GP and therapist, and tried everything - from breathing techniques and eye masks to sleeping tablets and hypnotics - but nothing worked.

Peter heard about Sleepio on the local news and decided to try it for himself. He found the structured pace to improving sleep and understanding techniques helpful, and started to put them into practice each night.

The results have been incredible.

“Since using the Sleepio programme, I have had the best and most consistent sleep I’ve had in 20 years. I no longer fear going to bed, attempting to get a good night’s sleep.”

Other Patient Feedback

“The Prof has an excellent bedside manner, which for an animation, just shows how powerful words, voice and message really are.”

Male, 55 years old

“I do feel it is really helping with my sleep. I realise it’s a long term commitment and I’ll continue to persevere and hopefully improve my sleep further.”

Female, 41 years old

“Excellent course thank you, but as was said at the outset you do need to be committed to see it through. Was very hard at times but well worth it.”

Female, 58 years old

“Sleepio has introduced structure to my sleep which has helped enormously.”

Male, 48 years old

Clinical Case Study

“When a product like Sleepio is evidence-backed and NICE-approved, it gives you confidence.”



Dr Juhi Tandon

Dr Juhi Tandon is a GP at The Simpson Centre in Buckinghamshire. Before having access to Sleepio, Juhi would frequently see patients with poor sleep. Many of these patients had multi-year histories of sleeping pills - and with no alternative solution to offer, it was difficult to address instances of over-dependence on medication.

“As a GP, it’s very difficult to take something away without offering something else in its place. I often found my consultations would over-run as patients were understandably reluctant to leave without sleeping pills. I tried signposting to sleep hygiene and local resources, but patients would often return in a few weeks with the same complaint.”

Juhi sees Sleepio as an excellent non-pharmaceutical addition to the range of treatments she can offer. It enables safer prescribing without the risk of polypharmacy, and finally gives patients

access to clinically-evidenced, gold-standard CBT. This has helped to build rapport with patients who were previously frustrated.

“It’s vital we practise evidence-based medicine. Both GPs and patients want to use solutions that are proven to be effective, so when a product like Sleepio is evidence-backed and NICE-approved, it gives you confidence. Of course, some patients are sceptical about trying something new - in those cases, I discuss the evidence behind Sleepio to show that it’s already helped a lot of people like them.”

With Sleepio, patients no longer have to wait for referrals into local services that can reduce motivation and exacerbate their condition. Patients can walk away from the consultation with a link to the Sleepio programme and get started the same day - meaning they no longer feel empty-handed without pills.

“There’s no need to wait for a referral. I can recommend Sleepio to a patient and they can start when they get home. We even have a template for Sleepio in AccuRx. I type in Sleepio, hit send, and the patient receives the text while they’re sitting with me. It’s an immediate solution where before I had nothing else to offer.”

Other Clinician Feedback

“The fact is, many GPs are finding they have very few options other than to prescribe hypnotics for insomnia. Availability and access to CBT for insomnia is too often poor across the country and that’s not going to change soon. I am delighted to be able to offer Sleepio for free to my patients - an effective digital tool with a robust clinical evidence base behind it. It’s a simple digital prescription, and it means that patients can access CBT, the NICE gold-standard for insomnia treatment, in their own time and at their own pace.”

Dr. Ian Wood, GP based in Buckinghamshire

“CBT for insomnia has not been readily available through local IAPT services. Sleepio is a safe and effective tool to offer to patients struggling with poor sleep. It can be recommended to motivated patients with confidence as there is a strong

evidence base supporting its efficacy. As a digital product with easy access the use of Sleepio supports the self-care agenda; reducing burden on traditional psychology services and helps patients to avoid seeking a pharmacological intervention for their poor sleep pattern”.

Dr Graham Jackson, GP and local system leader in Buckinghamshire

“I absolutely love the fact that when I talk about ‘proper’ sleep, Sleepio offers a tangible alternative to prescribing things that don’t give you proper sleep!”

GP

“Great responsiveness and understanding of general practice.”

GP

“Sleepio is liked by patients and clinicians, and simple to use.”

GP

“...an effective digital tool with a robust clinical evidence base behind it. It’s a simple digital prescription...”

Address Poor Mental Health in Your Population

Big Health supports NHS Commissioners to strategically commission evidence-based digital CBT to improve mental health at the population level.



If you would like to discuss providing Sleepio access in your population, please email will.goddard@bighealth.com

With Sleepio, commissioners can provide treatment that:

01 Addresses unmet needs

02 Prevents poor mental and physical health

03 Is scalable

04 Saves money

05 Is tested and loved by patients and clinicians

References

1. Morphy, H., Dunn, K.M., Lewis, M., Boardman, H.F., & Croft, P.R. (2007). Epidemiology of insomnia: a longitudinal study in a UK population. *Sleep*, 30, 274-80.
2. McManus S, Bebbington P, Jenkins R, Brugha T. (eds.) (2016) Mental health and wellbeing in England: Adult Psychiatric Morbidity Survey 2014. Leeds: NHS Digital.
3. Taylor, D. J., Lichstein, K. L., Durrence, H. H., Reidel, B. W., & Bush, A. J. (2005). Epidemiology of insomnia, depression, and anxiety. *Sleep*, 28(11), 1457-1464.
4. Vgontzas, A. N., Liao, D., Pejovic, S., Calhoun, S., Karataraki, M., & Bixler, E. O. (2009). Insomnia with objective short sleep duration is associated with type 2 diabetes: A population-based study. *Diabetes care*, 32(11), 1980-1985.
5. Cappuccio, F. P., Taggart, F. M., Kandala, N. B., Currie, A., Peile, E., Stranges, S., & Miller, M. A. (2008). Meta-analysis of short sleep duration and obesity in children and adults. *Sleep*, 31(5), 619-626.
6. Sofi, F., Cesari, F., Casini, A., Macchi, C., Abbate, R., & Gensini, G. F. (2014). Insomnia and risk of cardiovascular disease: a meta-analysis. *European journal of preventive cardiology*, 21(1), 57-64.
7. Office for National Statistics (2019). Overview of the UK population. Retrieved from: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/articles/overviewoftheukpopulation/august2019>; and NHS England (2015). 2015 Adult IAPT Workforce Census Report. Retrieved from: <https://www.england.nhs.uk/mentalhealth/wp-content/uploads/sites/29/2016/09/adult-iapt-workforce-census-report-15.pdf>. Assumes 10% prevalence of chronic insomnia in adults as per Reference 1 (Morphy, H. et al., 2007).
8. IQVIA (2020). IQVIA COVID-19 UK Market Intelligence Report - 2nd Edition. Monitoring the Impact of COVID-19 on the UK Pharma and BioTech Market.
9. Public Health England (2019). Dependence and withdrawal associated with some prescribed medicines: An evidence review. Retrieved from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/829777/PHE_PMR_report.pdf.
10. Pigeon, W., Pinguat, M., Conner, K. (2012). Meta-analysis of Sleep Disturbance and Suicidal Thoughts and Behaviors. *J Clin Psychiatry*.
11. Pigeon, W., Titus, C., Bishop, T. (2016). The Relationship of Suicidal Thoughts and Behaviors to Sleep Disturbance: a Review of Recent Findings. *Current Sleep Medicine Reports*, 2, 241-250.
12. Luik, A., Bostock, S., Chisnall, L., Kyle, S. (2016). Treating Depression and Anxiety with Digital Cognitive Behavioural Therapy for Insomnia: A Real World NHS Evaluation Using Standardized Outcome Measures. Cambridge University Press.

With thanks to our partners

