Institution: University College London		
Unit of Assessment: 4 – Psychology, Psychiatry and Neuroscience		
Title of case study: Improving the management of physical health in people with severe mental illness in the UK NHS and internationally		
Period when the underpinning research was undertaken: 2004 - 2018		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
Prof David Osborn	Professor of Psychiatric Epidemiology	2003 - Present
Dr Joseph Hayes	Wellcome Trust Clinical Research Career Development Principal Research Fellow	2010 - Present
Period when the claimed impact occurred: 2014 - 2020		
Is this case study continued from a case study submitted in 2014? No		

1. Summary of the impact

Researchers from UCL Psychiatry have demonstrated that the risk of people under 50 with severe mental illness (SMI) dying of cardiovascular disease is three times higher than those without, and that standard risk prediction models and management strategies are not effective in this population. New prediction tools and management strategies for people with SMI based on these findings have been adopted across the NHS. The research led to the inclusion of annual cardiovascular screening for all patients with SMI as a core element of the NHS 2019 Long Term Plan and was fundamental to the development of a RightCare pathway for people with SMI in all local health systems across England.

2. Underpinning research

Osborn and Hayes' programme of research in physical health and severe mental illness (which includes schizophrenia, bipolar disorder and other psychotic illnesses) has:

1) Demonstrated the widening mortality gap for these patient groups especially due to cardiovascular disease
2) Identified the cardiovascular risk factors responsible for these health inequalities
3) Developed interventions to reduce these inequalities across the NHS.

Excess cardiovascular mortality in severe mental illness

UCL research, originally led by Osborn (2007) and conducted with colleagues in UCL primary care, demonstrated a threefold increase in the risk of death from cardiovascular disease in people under 50 with severe mental illness from the UK General Practice Research Database **[R1]**; this was the first population-based study of cardiovascular and cancer mortality comparing ~50,000 people with severe mental illness to the general population (~300,000 people). Subsequent studies led by Hayes (2017) have tracked inequalities over time and showed the mortality gap for people with SMI has widened **[R2]**.

Excess cardiovascular co-morbidity in severe mental illness

UCL's large scale population studies revealed excess comorbid health problems and cardiovascular risk factors in people with SMI. This includes excess smoking, high cholesterol, HIV and obesity **[R2]**.

Improving management of cardiovascular risk in SMI

In a world first, UCL research developed and tested the first cardiovascular risk prediction tool including factors like SMI-diagnosis, prescriptions for antidepressants and antipsychotics, and

reports of heavy alcohol use among 38,000 people with SMI in primary care and showed that standard tools for screening (Framingham, SCORE, QRISK) lead to suboptimal treatment of people with SMI **[R3]**. The UCL team also developed and trialled novel evidence-based, complex nurse-led interventions (including the PRIMROSE intervention) for reducing cardiovascular risk in UK primary care **[R4]**.

Drug treatments in SMI and impact on physical co-morbidities

The UCL team exploited large scale longitudinal health data to determine the effectiveness and adverse physical effects of drug treatments in severe mental illness where randomised controlled trials would not be feasible (in relation to the size and duration of the trial necessary). This research included studies on treatment effectiveness and tolerability **[R5]** and anti-suicidal properties of mood stabilisers and adverse physical health effects of treatments for SMI, including cardiovascular risk factors such as weight gain **[R6]**. In addition, the UCL team also demonstrated the effectiveness of statins on both physical and psychiatric outcomes in people with SMI.

3. References to the research

[R1] Osborn DPJ, Levy G, Nazareth I, Petersen I, Islam A, King MB (2007). Relative risk of cardiovascular and cancer mortality in people with severe mental illness from the United Kingdom's General Practice Research Database. *Archives of General Psychiatry, 64(2)*: 242–249. doi:10.1001/archpsyc.64.2.242.

[R2] Hayes, J., Marston, L., Walters, K., King, M., & Osborn, D. (2017). Mortality gap for people with bipolar disorder and schizophrenia: UK-based cohort study 2000–2014. *British Journal of Psychiatry, 211(3)*: 175-181. doi:10.1192/bjp.bp.117.202606.

[R3] Osborn DP, Hardoon S, Omar RZ, Holt RI, King M, Larsen J, Marston L, Morris RW, Nazareth I, Walters K, Petersen I. (2015). Cardiovascular risk prediction models for people with severe mental illness: results from the prediction and management of cardiovascular risk in people with severe mental illnesses (PRIMROSE) research program. *JAMA Psychiatry*, *72(2)*: 143-51. doi: 10.1001/jamapsychiatry.2014.2133.

[R4] Osborn, D., Burton, A., Hunter, R., Marston, L., Atkins, L., Barnes, T., Holt, R., King, M., Michie, S., Morris, S., Nazareth, I., Omar, R., Petersen, I., Peveler, R., Pinfold, V., Walters, K., (2018). Clinical and cost-effectiveness of an intervention for reducing cholesterol and cardiovascular risk for people with severe mental illness in English primary care: a cluster randomised controlled trial. *The Lancet Psychiatry*, *5(2)*: 145-154. doi: 10.1016/S2215-0366(18)30007-5.

[R5] Hayes, J. F., Marston, L., Walters, K., Geddes, J. R., King, M., & Osborn, D. P. (2016). Lithium vs. valproate vs. olanzapine vs. quetiapine as maintenance monotherapy for bipolar disorder: a population-based UK cohort study using electronic health records. *World Psychiatry*, *15(1)*: 53-58. doi: 10.1002/wps.20298.

[R6] Hayes, J. F., Marston, L., Walters, K., Geddes, J. R., King, M., & Osborn, D. P. (2016). Adverse renal, endocrine, hepatic, and metabolic events during maintenance mood stabilizer treatment for bipolar disorder: a population-based cohort study. *PLoS Medicine*, *13(8)*. doi: 10.1371/journal.pmed.1002058.

4. Details of the impact

By revealing the scale of excess cardiovascular morbidity in people with severe mental illness, Hayes and Osborn's research has pushed the management and treatment of cardiovascular health in SMI to a prominent position on the international clinical practice and policy agenda. The research and subsequent extensive evaluations of a range of interventions have provided evidence that has underpinned the guidance and recommendations of both national and international health bodies and shaped national treatment programmes and pathways in England.

National Guidelines and policy:

The findings have permeated all national guidance governing cardiovascular health in SMIs in England. In 2014, research **[R3]** on cardiovascular disease (CVD) was incorporated into NICE Guidance on schizophrenia (CG178) and bipolar disorder (CG185) such that regular

comprehensive physical health checks are expressly recommended and flag up cardiovascular disease as a problem common in people with psychosis and schizophrenia **[S1].** The inclusion of cardiovascular risk in NICE Guidance CG178 **[S1]** has had sustained clinical impact on patient health through the NHS Quality Outcomes Framework (2020) for people with SMI **[S1].** This framework incentivises a focus on cardiovascular risk in SMI nationally by including an indicator on the Quality of Outcomes Framework (QOF) menu for "*the percentage of patients aged between 25 and 84 years old with [SMI] … who have had a CVD risk assessment in the preceding 12 months"*. The consultation documents for QOF 2015 (in which this indicator was first proposed and subsequently adopted as NM120) cites NICE Guidance CG178 and CG185 as evidence **[S1].**

The British Association for Psychopharmacology (BAP) guidance on the management of SMI incorporates the findings of the UCL team's research on drug treatments and their impact on co-morbidities **[R1, R3]**. The guidance helps prescribers and other practitioners assess and understand how various drug treatments (statins, antipsychotics) intersect with elevated risk of dying from cardiovascular disease in people with SMIs. In particular, the research informs *Evidence-based guidelines for treating bipolar disorder* (2016); *Evidence-based guidelines for the pharmacological treatment of schizophrenia* (2019); and the *Guidelines on the management of weight gain, metabolic disturbances and cardiovascular risk associated with psychosis and antipsychotic drug treatment* (2016) which Osborn co-authored **[S1].**

UCL's widening mortality gap findings **[R2]** are referenced by Public Health England in their 2018 briefing on *Severe Mental Illness and physical health inequalities* **[S2]** whose purpose is to increase the understanding of physical health conditions in people with SMI, add to the intelligence on the health inequality experienced by people with SMI and provide intelligence that allows the health and care system to focus on key areas for intervention to reduce premature mortality among people with SMI. Based on their body of work, Hayes and Osborn have been recruited to expert reference groups for Public Health England**,** where they contribute their knowledge as honorary public health consultants. These groups include the Indicator group which defined the national intelligence indicator for excess mortality in SMI for every region of the country (added in December 2020) **[S3],** which drive local NHS commissioners and leaders to inform services, to address health inequalities and to benchmark against other areas of the country. The Programme Lead and Analytical Lead for the Mental Health Improvement Network at PHE say that *"the work of Professors Hayes and Osborn contributed greatly to the physical health of people with an SMI being identified as a key PHE strategy priority. Their research has been a key driver to raise awareness among policy makers of this pressing issue and the interventions to address it"* **[S4]**. The team's research **[R2, R3]** was used widely as evidence for the international Lancet Psychiatry Commission 2019. This commission aimed to identify the best strategies to decrease health inequalities for people with SMI across the world. It is described as "*a blueprint for protecting physical health in people with mental illness*" **[S5].** Hayes was invited to provide an expert editorial accompanying the findings.

In health care settings, cardiovascular risk is managed by applying risk prediction tools to determine which patients require lipid modification (through statins) to prevent CVD. UCL research **[R3]** exposed the failure of some standard risk prediction tools for CVD to adequately predict risk in the SMI population, leading to fewer people with SMI receiving life-saving statins. It developed and tested specific, improved prediction tools to be used in their stead. Osborn was invited to give evidence to NHS England on this subject to inform their 2018 national guidance for all local health systems (CCGs) *Improving physical healthcare for people living with SMI in primary care*) **[S6]**. As a result, the guidance advises caution when using standard prediction tools in SMI, citing the research **[R3],** and advocates the use of the Lester tool which is informed by the UCL findings**.**

International Guidelines

The findings from UK primary care demonstrating an alarming, widening mortality gap for people with SMI **[R2]** have driven recent guidelines worldwide **[S7]** emphasising to clinicians and practitioners the need to effectively manage physical health in SMI. These include *The American Psychiatric Association Practice Guideline for the Treatment of Patients with Schizophrenia* (2019); *The Canadian Network for Mood and Anxiety Treatments and International Society for*

Bipolar Disorders (2018); Ireland's Mental Health Commission *Physical health of people with severe mental illness* (2018); and two linked policy documents by the World Health Organisation (WHO), *Excess Mortality in Persons With Severe Mental Disorders* (2016) and *Management of physical health conditions in adults with severe mental disorders (*2018).

Tools and interventions

UCL's research on the effectiveness of risk management tools and interventions has had a strong impact on their design and use. It informs the Lester tool**,** a NICE-endorsed risk management tool distributed widely to clinicians through all Royal Colleges and health bodies and recommended to all CCGs to improve cardiovascular care for SMI **[S5].**

The standard tool used for CVD risk screening in the English general population was previously QRisk2. This was updated in 2018 to QRISK3 which includes severe mental health problems and draws on UCL research to clarify the types of mental illness that each UK GP should include in the prediction tool. QRisk3 is now endorsed by NICE for lipid modification in primary care across the UK, thus improving the cardiovascular care of people with SMI.

Osborn worked with NHSE, PHE and NICE to produce the RightCare toolkit (2019) **[S8]** for commissioners to improve delivery of interventions to decrease physical health problems and premature death in people with SMI. This is a systematic guide, based on UCL's evidence, which defines how all local health services and commissioners in England must prioritise and improve annual cardiovascular screening and management for people with SMI. The recommendations are explicitly based on NICE and BAP guidance **[S1]** which evolved from the team's research on cardiovascular mortality and morbidity. The NHSE RightCare toolkit also recommends UCLs PRIMROSE intervention **[R5]**, an evidence based, novel nurse-led service that was trialled across 76 English general practices, and is now being delivered in the NHS in North London. Early evaluation results indicate a high level of patient satisfaction and effective goal-setting, and this integrated intervention led to decreased healthcare costs though a reduction in hospital admissions. There are now plans to roll out PRIMROSE supra-regionally in Yorkshire and Humberside **[S9]**. Additionally, the RightCare toolkit is the mechanism for delivering the central aims of the NHS Long Term Plan regarding physical health inequalities in SMI.

Programmes and pathways

The policies, tools and interventions outlined above have culminated in the NHS Long Term Plan (2019) **[S10]** for increasing the numbers of people receiving physical screening. UCL research **[R2]** contained in the PHE Briefing 'Severe Mental Illness and physical health inequalities' **[S2]** has informed the plan's objectives to "*Ensure that at least 280,000 people living with severe mental health problems have their physical health needs met [by 2020/2021]. By 2023/24, we will further increase the number of people receiving physical health checks to an additional 110,000 people per year, bringing the total to 390,000 checks delivered each year*". As of the end of March 2020 159,312 people on the GP mental health register in England had received health checks in the preceding 12 months **[S10]**.

5. Sources to corroborate the impact

[S1] Collated NICE and BAP guidelines citing the research

[S2] *Severe Mental Illness and physical health inequalities: briefing*. Public Health England. 27 September 2018. https://www.gov.uk/government/publications/severe-mental-illness-smi-physical-health-inequalities/severe-mental-illness-and-physical-health-inequalities-briefing#fn:1

[S3] Severe Mental Illness Profiling Tool, PHE. https://fingertips.phe.org.uk/profile-group/mental-health/profile/severe-mental-illness

[S4] Supporting statement from Programme Lead and Analytical Lead for the Mental Health Improvement Network, PHE.

[S5] Firth, J., Siddiqi, N., Koyanagi, A., et al. (2019) 'The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness, *The Lancet Psychiatry*, *6(8)*: 675-712. https://doi.org/10.1016/S2215-0366(19)30132

[S6] Improving physical health care for people with Severe Mental Illness in primary care: Guidance for CCGs. NHS England. 2018. https://www.england.nhs.uk/wp-content/uploads/2018/02/improving-physical-health-care-for-smi-in-primary-care.pdf
[S7] Collated international guidelines citing the research [PDF].
[S8] NHS England RightCare Toolkit: Physical health and cardiovascular disease in people with Severe Mental Illness. https://www.england.nhs.uk/rightcare/products/pathways/physical-ill-health-cvd-prevention-severe-mental-illness/
[S9] Statement from Clinical Director, Psychosis Services, Camden and Islington NHS Foundation Trust, confirming roll-out and benefits of PRIMROSE.
[S10] NHS Long Term Plan 2019. Department of Health (Ref 49).