



# RESEARCH

# INFORMATION

## The impact of major mental illness on outcomes and clinical care of people with diabetes, heart attack and stroke



### AIMS

This project had two aims. First, we sought to determine how having a major mental illness (schizophrenia, bipolar disorder or depression) affects the outcomes of type 2 diabetes, myocardial infarction (heart attack) and stroke. Second, we investigated whether people with a major mental illness received a different level of clinical care following onset of diabetes or occurrence of a heart attack or stroke when compared to people without mental illness.



### KEY FINDINGS

- Among about 225,000 people with type 2 diabetes, having schizophrenia, bipolar disorder or depression was associated with: (1) an increased risk of having a future heart attack or stroke; and (2) an increased risk of dying from any cause and from specific causes such as stroke or heart attack and lung cancer.
- People with diabetes and a major mental illness received a similar level of care in terms of diabetes monitoring during the first year after diabetes diagnosis, but were slightly less likely to receive retinopathy (eye disease) screening, when compared to people without mental illness.
- Among about 240,000 people with a heart attack, having a major mental illness was associated with: a marked increased risk of death within 30 days, 1 year and 5 years of the heart attack; and a lower chance of receiving coronary revascularisation (an operation on their blocked artery).
- Among about 240,000 people with a stroke, having schizophrenia or bipolar disorder was associated with an increased risk of death within 30 days and 1 year of the stroke.
- There was no evidence of any inequality in acute stroke care due to major mental illness.



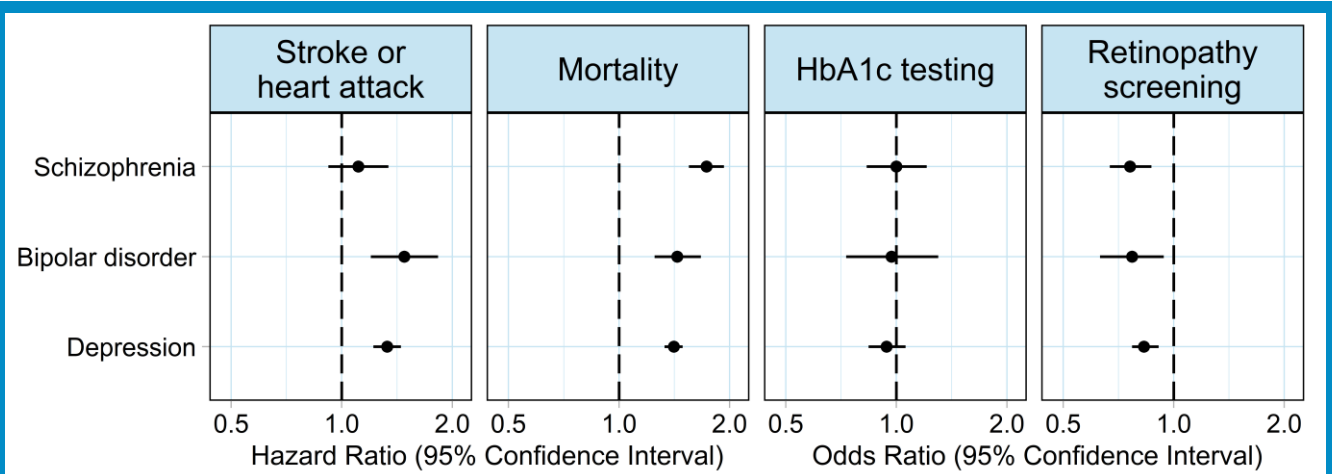
**WHAT DID THE STUDY INVOLVE?**

We used routinely collected, anonymised data from Scottish hospital admission, mortality and drug prescribing records, along with data from national disease registers and clinical care audits to perform the study. An individual's health records are linked by a unique number, which allowed us to combine health information from multiple datasets. Among people with diabetes, heart attack and stroke, we compared the occurrence of outcomes (e.g. death and/or subsequent stroke or heart attack) and the receipt of key processes of clinical care (such as eye disease screening in people with diabetes and procedures to unblock arteries following a heart attack) in people with and without prior hospitalisation for a major mental illness. These comparisons involved statistical modelling and accounted for factors that might differ between those with and without a mental illness and which might affect the risk of the outcome. These factors included age, sex, area-based deprivation level (i.e. level of affluence of the area in which an individual lives), and for some analyses also included additional factors such as smoking, having an alcohol use disorder, having prior cardiac disease and so on.



**WHAT WERE THE RESULTS AND WHAT DO THEY MEAN?**

People with type 2 diabetes and prior hospitalisation for a mental illness were more likely to be obese, smoke and have an alcohol use disorder than those without a mental illness. They were more likely to have a subsequent heart attack or stroke than people without a mental illness. As shown in Figure 1, this elevated risk, illustrated by dots to the right of the dashed vertical line, remained after accounting for prior cardiac disease, smoking and alcohol use disorder. Similarly, those with a mental illness were more likely to die from any cause, and in particular from cardiovascular diseases (such as heart attack and stroke) and lung cancer. This means that after being diagnosed with diabetes, people with a major mental illness are more likely to have a poorer outcome than those without mental illness.



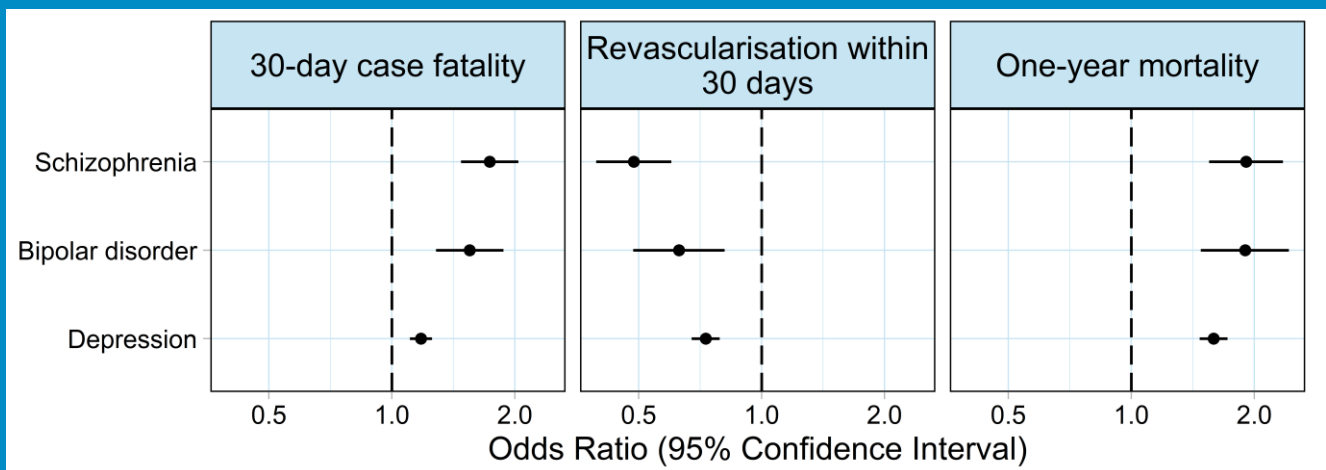
**Figure 1: Outcomes and processes of care for people with diabetes. Ratios for people with a mental health condition, compared to those without a mental health condition. Ratios which lie to the right of the dashed line indicate that people with a mental illness are more likely to have the outcome or process of care, whilst ratios to the left of the line indicate they are less likely to have the outcome or process of care**



**WHAT WERE THE RESULTS AND WHAT DO THEY MEAN?**

When we compared measures of care for diabetes, we found that people with a major mental illness were just as likely as those without a mental illness to have their glycated haemoglobin (average blood sugar levels) checked within the first year following diabetes diagnosis. However, they were less likely to receive retinopathy (eye disease) screening during that first year (illustrated by the dots to the left of the dashed vertical line in Figure 1). These findings suggested that, within the first year of diabetes diagnosis at least, people with a major mental illness are receiving the appropriate care for their diabetes in terms of blood test monitoring, but not for eye disease screening.

As shown by the dots to the right of the dashed vertical line in Figure 2, we found that people with a major mental illness were far more likely to die than those without a mental illness in the 30 days following a heart attack. We also found that people with a mental illness were less likely to receive revascularisation procedures within 30 days of having a heart attack. After accounting for the lower rate of revascularisation in people with a mental illness, the risk of dying at one year remained higher in this group, as did the risk of having a further heart attack. These findings indicate that people with a major mental illness have a much worse outcome following a heart attack than those without mental illness. This is only partly due to them being less likely to receive procedures which could improve their chances of a better outcome.



**Figure 1: Mortality and revascularisation after a heart attack. Odds ratios for people with a mental health condition, compared to those without a mental health condition.**

Among people with a stroke, we found that, compared to people without mental illness, those with schizophrenia or bipolar disorder (but not depression) were more likely to die in the 30-days and first year after a stroke. People with schizophrenia, bipolar disorder *and* depression were more likely to die within 5 years of the stroke and to have a recurrent stroke than those without a mental illness.

Reassuringly, we found little evidence of differences in care for acute stroke between those with and without a mental illness. We looked at Scottish Stroke Care Standards including admission to a stroke unit, undergoing a brain scan and receiving a swallow screen and aspirin within the recommended time frames.



## WHAT IMPACT COULD THE FINDINGS HAVE?

- Our findings highlight the need to:
  - improve the outcomes of key physical diseases among those with a mental illness
  - reduce smoking, alcohol misuse and obesity in people with diabetes and mental illness
  - ensure people with mental illness receive regular retinopathy screening
- Our findings reveal stark inequalities in access to revascularisation procedures among people with a major mental illness. Further detailed investigation is needed to understand the reasons for this and, where appropriate, to improve access to treatment for these patients



## HOW WILL THE OUTCOMES BE DISSEMINATED?

We have presented project findings at many national and international conferences attended by a wide variety of academic researchers and health services staff. We have also presented at a number of local research meetings. We held a knowledge exchange meeting at the start of the project, which was attended by a wide range of stakeholders from research, government and charities. Future dissemination activities will involve sharing our findings in person with the Scottish Government and representatives from mental health charities in Scotland. We are currently drafting three scientific articles for publication in international peer-reviewed journals.



## CONCLUSION

People with a major mental illness are more likely than those without a mental illness to have poor outcomes of diabetes, heart attack and stroke. Part of this increased risk for diabetes can be explained by higher levels of smoking, drinking alcohol and obesity.

Although people with a major mental illness are equally likely to receive some key processes of care for physical diseases, there are stark inequalities in other measures of clinical care and treatment. Improvement of this care could lead to better outcomes for this vulnerable group of people.



## RESEARCH TEAM & CONTACT

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### Additional Information

Project completed: 30<sup>th</sup> November 2019

Award received: £223,216

