

HSC-PBPP End of Project Reports – January 2024

Application Reference (click on reference for EPR Summary)	Applicant	Applicant Organisation	Title and Purpose of study	Date of Approval
1516-0215	Colin McCowan	University of Glasgow	Long term weight loss trajectories in participants in a randomised controlled trial of a weight management and healthy lifestyle programme for men delivered through professional football clubs: the Football Fans in Training follow up	20/08/2015
1516-0219	William Whiteley	University of Edinburgh	Whole population automated reading of brain imaging reports in linked electronic health records (WARBLER)	19/11/2015
1516-0291	Sarah Brown	The State Hospital	Neuropsychological Deficits in Mentally Disordered Offenders Related to Risk and Cognitive Decline: A 10-year Follow-Up Study	26/11/2015
1516-0405	Dr Pia Hardelid	University College London	The hospital burden of influenza and other respiratory pathogens in children	06/01/2016
1516-0480	Prof Damien McElvenny	Institute of Occupational Medicine (IOM)	Cancer mortality and incidence in the British rubber industry - a 45 year follow-up	13/01/2016
1516-0526	David McCollum	University of St Andrews	Economic change and internal population dynamics: an innovative study of new residential mobilities in Scotland	10/10/2016

1516-0566	Dr. Andrea Woolner	University of Aberdeen	The impact of birth-related perineal injury on future pregnancies: a Scottish population-based cohort study	29/08/2016
1516-0595	Sarah Stock	University of Edinburgh	QUIDS – Quantitative Fibronectin to help Decision making in women with symptoms of Preterm labour	11/05/2016
1516-0597	Paul Welsh	University of Glasgow	An assessment of the efficacy and cost effectiveness of routine measurement of high-sensitivity troponin T and troponin I to predict cardiovascular events	22/06/2016
PAC 01/14 PAC 02/14	Dr Barry Rodgers-Gray	Strategen	Identifying the clinical burden of prematurity and Respiratory Syncytial Virus (RSV) infection within the NHS Scotland assessment of the potential association between Respiratory Distress Syndrome at birth and future RSV-related hospitalisations/ Identifying and quantifying the association between Respiratory Syncytial Virus (RSV) infection in the first 2 years of life and long term consequences of respiratory disease and asthma	19/09/2014
PAC 68/14	Colin Simpson	University of Edinburgh	Seasonal Influenza Vaccination Effectiveness II (SIVE II)	01/06/2014
1516-0573	Laura Lyall	University of Glasgow	A health informatics approach to the assessment of prescribing and clinical outcomes in bipolar disorder: national Scottish data linkage study	
1516-0370	Richard Peter Gerardus ten Broek	Radboud University Medical Center, Nijmegen, the Netherlands	Adhesion-related hospital readmissions after abdominal and pelvic surgery: An update of the SCAR studies	08/09/2016
1516-0445	Christopher McGovern	University of Glasgow	Mortality and morbidity after burn injury in Scotland	

1516-0489	Colin Simpson	University of Edinburgh	Developing a national learning health system for asthma	30/11/2016
1516-0387	Steve Turner	University of Aberdeen	Linking antenatal maternity data to noncommunicable disease data in children and adults.	16/06/2016
1516-0196	Kathryn Fitzpatrick	University of Oxford	Short and longer-term outcomes for women and their children according to intended mode of delivery after previous caesarean section	
1516-0398	Sarah Curtis	University of Edinburgh	Recession, austerity and health: changing area socio-economic conditions and their relationship to individual health and wellbeing outcomes in Scotland	
1516-0044	Laura Hay	University of St Andrews	Teenage Pregnancy among Looked After Young People (LAYP) & Care Leavers in Fife: a data linkage study	
1516-0626	Dr Caroline Jackson	University of Edinburgh	Psychiatric illness and physical chronic disease co-morbidity in Scotland: a feasibility and pilot study	

Appendix: End of Project Report Summaries

PAC 01/14 PAC 02/14

Dr Barry Rodgers-Gray

Identifying the clinical burden of prematurity and Respiratory Syncytial Virus (RSV) infection within the NHS Scotland assessment of the potential association between Respiratory Distress Syndrome at birth and future RSV-related hospitalisations/

Identifying and quantifying the association between Respiratory Syncytial Virus (RSV) infection in the first 2 years of life and long term consequences of respiratory disease and asthma

End of Project Summary

Public Benefit Impact

Respiratory syncytial virus (RSV) is a common respiratory virus that usually causes mild, cold-like symptoms in young children during the winter months. However, RSV can sometimes cause severe respiratory illness, particularly in premature babies and those with diseases that affect the lungs, heart, or immune system. Those children with severe infection are often admitted to hospital. Indeed, RSV is recognised as one of the leading causes of hospitalisation in young children worldwide. Severe RSV infection during infancy has also been linked with increased rates of childhood asthma. The outcomes of our study provide important information on the burden of RSV in children that will help hospitals plan and better prepare for the yearly outbreaks of RSV infections each winter. Our data also support the need for a vaccine and new treatments for RSV.

Aims

Our study assessed the burden of RSV in children born in Scotland both in terms of hospital admissions for severe infections and the link with childhood asthma.

Data

There were two datasets used in our study: 1) Data on all children born in Scotland between 2000 and 2011, including details of any hospital admissions for RSV during the first 2 years of life; and, 2) Data on all children born in Scotland between 1996 and 2011, including details of any hospital admissions for RSV during the first 2 years of life and admission for asthma up to 18 years of age.

Methodology

All data were from Public Health Scotland databases and were analysed by Public Health Scotland. Our study fulfilled its aims: describing the burden of RSV infection in young children in Scotland and finding a clear link between severe RSV infection and development of asthma. The results of our study were published in two papers:

1. Thwaites R et al. Clinical Burden of Severe Respiratory Syncytial Virus Infection During the First 2 Years of Life in Children Born Between 2000 and 2011 in Scotland. *Eur J Pediatr.* 2020 May;179(5):791-799. doi: 10.1007/s00431-019-03564-9. Epub 2020 Jan 7. PMID: 31912234
2. Coutts J et al. Association Between Respiratory Syncytial Virus Hospitalization in Infancy and Childhood Asthma. *Pediatr Pulmonol.* 2020 May;55(5):1104-1110. doi: 10.1002/ppul.24676. Epub 2020 Feb 10. PMID: 32040885

In addition, 16 conference abstracts were presented on the data and outcomes from the study.

Outcomes

Our study showed that of 623,770 children born in Scotland between 2000 and 2011, 13,362 (2.1%) were admitted to hospital at least once for RSV infection by 2 years of age. Admissions for RSV infection represented 6.2% of all inpatient bed days, which rose to 14.2% during December and January. Put another way, RSV infection caused over 1,400 hospitalisations in children <2 years old each year.

A clear link was also shown between severe RSV infection and childhood asthma in a population of 740,418 children born in Scotland between 1996 and 2001. Hospital admission for asthma and asthma medication use was three times higher in those children who had been admitted to hospital for RSV infection before 2 years of age (4.8%) than those that had never been hospitalised with RSV (1.5%).

Future Questions

A key question to explore is what the mechanism(s) are behind the increased rates of asthma seen in children with a history of RSV hospitalisation

Seasonal Influenza Vaccination Effectiveness II (SIVE II)

End of Project Summary

1	Aims	
	What did the study set out to achieve?	To evaluate the effectiveness and safety of influenza vaccine.
2	Public Benefit Impact	
	How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered.	The vaccine was safe and effective. Modest effectiveness was found amongst older groups.
3	Data	
	What data were received/processed/collected? Was it as expected? Please give brief details.	GP data linkage to SMR01, ECOSS and SIRS
4	Methodology	
	How did you collect the data?	GP data via Albasoft
	How did you process the data?	Albasoft as trusted third party processed the data
	How did you provision/publish the information?	HTA report
	Did your study scope change from its original aims? Please give brief details.	No
5	Outcomes:	
	The outcomes / results of your proposal. Please give brief details.	The study found that LAIV was safe and effective in decreasing RT-PCR-confirmed influenza in children. TIV was safe and significantly effective in most seasons for 18- to 64-year-olds, with positive

		vaccine effectiveness in most seasons for those people aged ≥ 65 years (although this was significant in only one season).
6	Future Questions:	
	Have the processes / results raised further questions for future exploration? Please give brief details.	To understand if vaccine reduces hospitalisation and deaths when sufficient numbers of PCR tests are available

1516-0044 Laura Hay

Teenage Pregnancy among Looked After Young People (LAYP) & Care Leavers in Fife: a data linkage study

End of Project Summary

1	Aims	
	What did the study set out to achieve?	The study aimed to use data linkage techniques to compare teenage pregnancy rates and outcomes among care experienced young people (CEYP) in Fife with that of their non-care experienced peers from a similar socioeconomic background.
2	Public Benefit Impact	

<p>How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered.</p>	<p>The study looked at whether teenage pregnancy is more common among care experienced young people (CEYP) than their non-care experienced peers from a similar socioeconomic background. CEYP are thought to be at increased risk of experiencing teenage pregnancy but little is known about teenage pregnancy rates among CEYP in Scotland.</p> <p>Teenage parenthood can be a very positive experience for many young people. However, it is also associated with a range of short and long-term negative outcomes for both mother and baby. The needs and experiences of CEYP vary but CEYP may face additional challenges as young parents and be more susceptible to the adverse outcomes and socioeconomic disadvantage associated with teenage pregnancy.</p> <p>Corporate parents have an important role to play in supporting care experienced young parents, as well as empowering CEYP to prevent unwanted teenage pregnancy. However, despite its importance, little is known about teenage pregnancy rates among CEYP in Scotland. This study was therefore undertaken to provide estimates of teenage pregnancy among CEYP in Fife, to help corporate parents better understand the teenage pregnancy related needs of CEYP.</p> <p>The study found that CEYP were twice as likely to experience a live birth before age 20 and 1.3 times more likely to experience a termination of pregnancy before age 20 than their non-care experienced but similarly deprived peers. The findings suggest that CEYP are likely to have a greater need than their non-care experienced peers for support in preventing unwanted teenage pregnancy and as young parents.</p> <p>The findings will be used by NHS Fife and its corporate parent partners to better meet the needs of CEYP. Given the lack of data on teenage pregnancy rates among CEYP in Scotland more generally, the study's findings are also likely to be of interest to other health board and local authority areas in Scotland.</p>
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3	Data	
	<p>What data were received/processed/collected?</p> <p>Was it as expected? Please give brief details.</p>	<p>Social care data was linked with NHS data (described below).</p> <p>The study methods were undertaken as expected.</p>
4	Methodology	
	<p>How did you collect the data?</p> <p>How did you process the data?</p>	<p>Social care administrative data for 1119 females looked after by Fife Council between October 1991 and March 2015 were linked to NHS teenage pregnancy data.</p> <p>Probabilistic linkage was used to match CEYP demographic data (names, sex, date of birth and postcodes) to the Community Health Index (CHI) number. The CHI number was used to identify teenage pregnancy outcomes from national Scottish Morbidity Record (SMR) datasets, SMR01 and SMR02.</p> <p>Outcomes for CEYP were compared with a group of non-care experienced peers from a similar socioeconomic background. Three non-care experienced young people (non-CEYP) were selected for every CEYP, matched by year of birth, sex and socioeconomic status at birth.</p>
	<p>How did you provision/publish the information?</p>	<p>We would like to acknowledge the support of the eDRIS Team (Public Health Scotland) for their involvement in obtaining approvals, provisioning and linking data and the use of the secure analytical platform within the National Safe Haven.</p> <p>The findings have been presented to NHS Fife and the Scottish Government and were presented at the International Population Data Linkage Network conference in September 2022. Submission of the findings to peer reviewed scientific journals is planned.</p>

	<p>Did your study scope change from its original aims? Please give brief details.</p>	<p>The study's aims and main objectives were undertaken as originally planned. However, analysis of the secondary objectives was more limited than originally planned, due to restrictions accessing the physical safe haven during the Covid-19 pandemic.</p>
5	<p>Outcomes:</p>	
	<p>The outcomes / results of your proposal. Please give brief details.</p>	<p>An acceptable match to a CHI number was achieved for 90.5% (1013/1119) of CEYP. 889 CEYP were fully matched to 2664 non-CEYP.</p> <p>CEYP were twice as likely as non-CEYP to experience a live birth before age 20 (Relative Risk 2.32, 95% Confidence Interval 2.06 to 2.62). 38.4% (341/889) of CEYP had a live birth before age 20, compared with 16.5% (440/2664) of non-CEYP ($p < 0.001$).</p> <p>CEYP were 1.3 times more likely than non-CEYP to experience a termination of pregnancy before age 20 (Relative Risk 1.33, 95% Confidence Interval 1.06 to 1.66). 11.2% (100/889) of CEYP experienced a termination of pregnancy before age 20, compared with 8.5% (226/2664) of non-CEYP ($p < 0.05$).</p>
6	<p>Future Questions:</p>	
	<p>Have the processes / results raised further questions for future exploration? Please give brief details.</p>	<p>Qualitative research to explore the views of CEYP would also be useful.</p> <p>Undertaking the cross-sectoral data linkage required for the study was a challenging, time-consuming process. In its current form, the data linkage approach used in the study is unlikely to be a practical way forward for NHS Fife and the Fife Corporate Parent Board to use to readily identify other health outcomes for CEYP in Fife. It is however a useful research tool.</p>

1516-0196 Kathryn Fitzpatrick

Short and longer-term outcomes for women and their children according to intended mode of delivery after previous caesarean section

End of Project Summary

1	Aims	
	What did the study set out to achieve?	The overall aim of the research was to provide evidence-based information to facilitate women making informed decisions with respect to planned mode of delivery after previous caesarean section, by investigating the short and longer-term outcomes for women and their children according to intended mode of delivery after previous caesarean section
2	Public Benefit Impact	
	How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered.	The research can inform women and their partners, clinicians, and clinical guidelines around birth after previous caesarean. In particular, the research provides valuable information to manage and counsel women with previous caesarean about the risks and benefits of their future birth choices, as recommended by clinical guidelines.
3	Data	

	<p>What data were received/processed/collected?</p> <p>Was it as expected? Please give brief details.</p>	<p>The research used the following linked Scottish national datasets: National Records of Scotland (NRS) live births and stillbirths; The Scottish Morbidity Record Maternity Inpatient and Day Case dataset (SMR02); The Scottish Morbidity Record General/Acute Inpatient and Day case dataset (SMR01); NRS deaths; The Scottish Stillbirth and Infant Death Survey (SSBID); The Child Health Surveillance Programme Pre-School system (CHSP-PS) data; prescribing information system (PIS); Pupil Census; and the Community Health Index (CHI) database. The linked Scottish national data with all personal identifiers removed (apart from the child's date of birth) was made available to the researchers named on the PBPP through password protected remote access to the eDRIS safe haven.</p> <p>I experienced lengthy delays in getting access to the linked Scottish national datasets I required. I first received some of the data nine months after obtaining the necessary approvals but there were errors in the way the data had been extracted. It took a further eight months to obtain a correct version of most of the data I required and a further ten months to obtain a correct version of all the data. This caused significant delays in the research.</p>
4	Methodology	
	How did you collect the data?	No primary data collection was used for this research. The research used linked routinely-collected Scottish national health and education data.
	How did you process the data?	The linked Scottish national data with all personal identifiers removed (apart from the child's date of birth) was made available to the researchers named on the PBPP through password protected remote access to the eDRIS safe haven. The researchers then cleaned and analysed the data using statistical software in the safe haven.

	<p>How did you provision/publish the information?</p>	<p>The research has been presented at appropriate conferences such as the British Maternal and Fetal Medicine Society Annual conference. The findings have also been published in peer-review journals including PLOS Medicine, the British Journal of Obstetrics and Gynaecology, and Psychological Medicine. Patient and public involvement (PPI) representatives in the perinatal field also advised on the interpretation and communication of the findings. This included producing, with the help of the PPI representatives, a plain English one page summary and a plain English longer leaflet of the research findings. Dissemination through other channels was also used as appropriate e.g. the University of Oxford Press Office, the NPEU website and social media such as twitter.</p>
	<p>Did your study scope change from its original aims? Please give brief details.</p>	<p>No</p>
<p>5</p>	<p>Outcomes:</p>	
	<p>The outcomes / results of your proposal. Please give brief details.</p>	<p>My research suggests that for women who have had a caesarean section in the past, attempting a vaginal birth - known as a planned VBAC - in a next pregnancy compared to planning another caesarean increases the chance of various serious birth-related complications for both the mother and her baby. However, the chance of having serious birth-related complications was small for either birth approach. For example, nearly 2 in every 100 women planning a VBAC and nearly 1 in every 100 women planning another caesarean experienced serious birth-related maternal complications such as needing a blood transfusion or womb (uterine) rupture. My research also suggests that out of 10 women planning a VBAC, 7 will give birth vaginally and 3 will have an unplanned caesarean section when they are in labour, with most of the maternal birth-related complications occurring among the women who needed an unplanned in-labour caesarean section. My research also found that planned VBAC compared to planned repeat caesarean increases the chance of the women subsequently having pelvic floor surgery including surgery for pelvic organ prolapse and urinary incontinence. However, these increased risks were only seen in women who actually gave birth vaginally as planned. My research also found that women who planned another caesarean section were more likely than women who planned a VBAC to be given medication to treat mental health problems in the year after they gave birth. This does not necessarily mean that mental health is better in the planned VBAC group, with further research in this area needed. My</p>

		research also found that children born following a planned VBAC compared to a planned repeat caesarean had a similar chance of having special educational needs in childhood, a marker of neurodevelopmental adversity.
6	Future Questions:	
	Have the processes / results raised further questions for future exploration? Please give brief details.	Given the paucity of research, there is a particular need for further studies into the longer-term effects on women and their children of planned mode of birth after previous caesarean. This should include further research to establish the reasons behind the observed association between planned mode of birth after previous caesarean and women's subsequent use of psychotropic medication. In addition, while my research provides some reassurance regarding the effect of planned mode of birth after previous caesarean on the child's longer-term neurodevelopment, further research is needed not only to establish if the findings can be replicated in other populations but also to explore the effects of planned mode of birth after previous caesarean on other measures of adverse neurodevelopmental outcomes in the child.

Long term weight loss trajectories in participants in a randomised controlled trial of a weight management and healthy lifestyle programme for men delivered through professional football clubs: the Football Fans in Training follow up

End of Project Summary

Public Benefit Impact

The overall study showed the longer-term benefits on weight loss and health of participation in the Football Fans in Training (FFIT) randomised controlled trial (RCT). The linkage aspect of the study was to show that participants in FFIT could be followed up using routine data to allow examination of key clinical outcomes for participants. This study has shown this is a feasible approach and shown a mechanism which would allow the wider FFIT programme to examine its longer-term impact on those participating.

Aims

To explore using linkage to routinely-collected NHS datasets to allow long-term, low-cost, passive follow-up of FFIT participants through investigation of long-term clinical health outcomes (through data linkage on hospitalisations, mortality, prescribing, cancers, diabetes and, when possible, blood test results) of RCT participants.

Data

Participant names, gender, dates of birth, addresses and ID numbers from the original trial were securely submitted to eDRIS by a University of Glasgow Information Security manager and then indexed to their Community Health Index (CHI) number. Records were extracted on hospital episodes, deaths and recorded cause of death, cancers and prescribing. All identifiers on the extracted data were replaced by ID numbers and securely transferred back to the IS manager at UoG. The new dataset was linked to the original trial data and made available to the project statistician for analysis within a secured network. We were unable to link diabetes care records and blood test laboratory results as these were unavailable.

Methodology

Linkage was performed for the 645 indexed men to hospital episode statistics, cancer registry, the PIS and National Records of Scotland death records. Owing to the small numbers of recorded deaths, cancer registrations and admissions to a psychiatric unit, statistical comparisons between the groups and across different time periods were restricted to general hospital admissions (SMR01) and prescribing (PIS) records.

Outcomes

The data linkage utility study demonstrated that it was highly feasible to follow up participants through data linkage within the Scottish system, with a 99.5% success rate in linking data to routine NHS records for men who provided permission to do so.

High proportions of participants had been admitted to hospital and/or received prescribed medications from 2009 onwards, although we did not detect any significant differences in hospital admissions in any comparisons.

Men in the RCT comparison group received more prescriptions than those in the RCT intervention group. Men across both groups received more prescriptions in the 12-month period during the FFIT programme than in the 12 months prior to the FFIT programme. There was some suggestion that men received more preventative cardiovascular, urinary tract and musculoskeletal medications in the 12 months of the FFIT programme.

1516-0219 William Whiteley

Whole population automated reading of brain imaging reports in linked electronic health records (WARBLER)

End of Project Summary

Unfortunately, there has been no public benefit impact from this study, as data has yet to be received.

We are in the process of renewing our application with the following plan:

1. Working with eDRIS to anonymise brain imaging reports
2. Obtaining brain imaging data from SMI as well as boards

This process proved to be slower than anticipated.

Recession, austerity and health: changing area socio-economic conditions and their relationship to individual health and wellbeing outcomes in Scotland

End of Project Summary

1	Aims	
	What did the study set out to achieve?	We aimed to assess how individual risk of mental illness, recorded by self-report and by NHS general practitioner prescriptions, related to economic and social conditions and other 'wider determinants' in the individual's place of residence (controlling for their individual attributes), and how the findings might relate to policy and practice addressing mental health inequalities and care in Scotland.

2	Public Benefit Impact	
	<p>How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered.</p>	<p>We have disseminated our findings widely across Scotland, to audiences including specialists in population mental health and strategies to address mental health inequalities. A list of these engagement and communication activities, is provided in section 5 and the appendix to this submission. Research papers from this project were referenced in an Advice Paper submitted by the Royal Society of Edinburgh to Scottish Government in response to the inquiry on a New Mental Health and Wellbeing Strategy (September 2022)</p> <p>file:///C:/Users/Geography/Documents/RSE/RSE%20advice%20paper%20on%20MH&WB%20strategy/Published-AP-New-mental-health-and-wellbeing-strategy-2022.pdf .</p> <p>We have also demonstrated innovative approaches to analysing and interpreting records on mental health prescribing, that can inform researchers in public sector organizations as well as academic institutions.</p>
3	Data	
	<p>What data were received/processed /collected?</p> <p>Was it as expected? Please</p>	<p>The eDRIS data used in this project related to NHS general practitioner prescriptions of antidepressants (including dosage), anxiolytics and antipsychotics, and use of inpatient and outpatient services for mental health conditions.</p>
4	Methodology	
	<p>How did you collect the data?</p>	<p>The eDRIS data were approved for use in this study by the PB&PP committee. Approved Edris data were transmitted, under secure conditions, to the data managers for the Scottish Longitudinal Study (SLS). The SLS managers linked the information to data on individuals,</p>

	<p>drawn from the SLS, which was analysed by our research team in a secure laboratory at NRS, Ladywell House, Ladywell Road, Edinburgh, EH12 7TF.</p>
<p>How did you process the data?</p>	<p>Access for our approved researchers to analyse the data was provided under secure conditions in the Secure Research Service laboratory in Edinburgh that holds the Scottish Longitudinal Study data. The data were analysed statistically in ways which protect individual confidentiality, while testing for factors which explain variation in mental health across a very large sample of residents from across Scotland.</p>
<p>How did you provision/publish the information?</p>	<p>Results released for publication were cleared by the SRS staff prior to publication. The results were disseminated in peer reviewed research papers and through various Communication and Engagement Activities: (see section on 'dissemination' above, Section 5, and in the attached appendix.)</p> <p>Acknowledgement: Permission to use the SLS and other data sources has been approved by the data controllers of the SLS and by the Public Benefit and Privacy Panel, responsible for governance of use of NHS eDRIS statistics, held securely in the ESRC Administrative Data Research Centre in Edinburgh. The analysis was undertaken in the National Records of Scotland SLS secure data centre. The SLS Data Custodian approved the manuscript for publication. The help provided by staff of the Longitudinal Studies Centre Scotland is acknowledged. The LSCS is supported by the ESRC/JISC, the Scottish Funding Council, the Scientists Office and the Scottish Government. The authors alone are responsible for the interpretation of the data. Census output is Crown copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland.</p>

	<p>Did your study scope change from its original aims? Please give brief details.</p>	<p>The principal focus of the research was on how locally variable socio-economic factors were associated with mental health inequalities in Scotland in the period 2009-2015. We initially focussed especially on varying conditions in the local economy as determinants of mental health. We then proceeded to put these findings into context by including analysis of local variation in other ‘wider determinants’ of mental health (crime rates, social cohesion, urban rural disparities and proximity to green space).</p>
5	<p>Outcomes:</p>	
	<p>The outcomes / results of your proposal. Please give brief details.</p>	<p>We have published 6 peer reviewed papers to date, and various presentations which are listed above under ‘dissemination’, and summarised in the attached appendix reporting on the outputs from this project.</p> <p>We report on research using data for a large and representative sample of individuals living in Scotland, drawn from the Scottish Longitudinal Study, including mental health indicators, based on self-reported mental health recorded in the 2011 population census and on NHS data recording receipt of general practitioner prescriptions for mental illnesses and service use 2009-2015. The research examined how mental illness recorded by self-report relates to medical prescribing, and how variation in risk of mental illness, measured using prescription data, relates to personal characteristics, and, in addition, is associated with conditions in the person’s local community.</p> <p>Our key findings were that, controlling for individuals’ personal and household characteristics, risk of mental illness was associated with conditions in their local area of residence. These area level risk factors included, at the scale of Local Authorities, the impacts on employment rates of the ‘great recession’ (starting in 2008), and the loss of income due to subsequent welfare benefit reforms. Also, at the more local level of Data Zones, area risk factors for individual’s mental health included levels of poverty, levels of reported crime, urban/rural differences,</p>

		<p>exposure to green space, residence in Islands vs. mainland settings, and proxy measures of ‘social cohesion’.</p> <p>Further technical advances include development of small area indicators of social cohesion. These include primary development and application of Peter Congdon’s ‘Social Fragmentation Index’ (SFI) to Scotland in order to further contextualise our data analyses. We believe this represents its first use in the Scottish context. A new ‘Social Gifting’ measure was also tested as a proxy for local social cohesion.</p> <p>As explained in the appendix, our research has demonstrated to collaborators in NHS Scotland new approaches aimed at modelling the incidence of new cases of anti-psychotic and psychotropic drug prescription in the population.</p> <p>Publications from this project were cited in an advice Paper submitted by the Royal Society of Edinburgh to Scottish Government in response to the Inquiry on a New Mental Health and Wellbeing Strategy. file:///C:/Users/Geography/Documents/RSE/RSE%20advice%20paper%20on%20MH&WB%20strategy/Published-AP-New-mental-health-and-wellbeing-strategy-2022.pdf</p>
6	Future Questions:	
	<p>Have the processes / results raised further questions for future exploration? Please give brief details.</p>	<p>Our research findings show how, during a period of economic crisis and recovery (the ‘great recession starting in 2008) mental health inequalities were associated with the geographically variable economic impacts of recession and subsequent austerity on local communities and with local social conditions reflected in patterns of crime levels and social cohesion. Given the recent indications of a new recession following the impacts of the COVID pandemic, our findings could inform future research on questions about how policy and practice should take into account the geographically variable ‘wider determinants’ of mental illness.</p> <p>Future research might also be focussed on how to target action designed to ‘level up’ conditions across Scotland (and the UK as a whole)</p>

		in ways which would benefit mental health and reduce geographical inequalities.
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1516-0291 Sarah Brown

Neuropsychological Deficits in Mentally Disordered Offenders Related to Risk and Cognitive Decline: A 10-year Follow-Up Study

End of Project Summary

The present study is a ten-year follow-up of all patients who underwent neuropsychological assessment during while inpatients in the State Hospital during 2004-5. We aimed to determine if baseline cognitive deficits are related to patient risk at ten-year follow-up and to assess change in neuropsychological abilities over a ten-year period. The aim of PBPP data was to help determine participant location.

Data on neuropsychological abilities at baseline and at follow-up. Risk-related outcomes, such as HCR-20 scores and inpatient aggression, were collected as well. Data collected from the PBPP were primarily related to service use.

Data collected from the PBPP were used to help trace patient current location and to confirm those who were deceased. Once location was determined, participants were approached to participate in the study.

87 individuals were located using data from TSH and PBPP. 13 were deceased.

In order to reduce aggressive and violent behaviour we must first understand the aetiology of violence and aggression over time. This study sought to determine if cognition influenced set behaviours and used PBPP data to help locate potential participants for purposed of assessment.

1516-0370 Richard Peter Gerardus ten Broek

Adhesion-related hospital readmissions after abdominal and pelvic surgery: An update of the SCAR studies

End of Project Report

1516-0387 Steve Turner

Linking antenatal maternity data to noncommunicable disease data in children and adults.

End of Project Summary

Aims What did the study set out to achieve? To relate common antenatal size to the postnatal development of common non communicable diseases in a whole population.

2 Public Benefit Impact How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered. Our results demonstrate that antenatal size and growth occur before onset of non communicable disease. These findings add to an emerging literature of “fetal epidemiology” and highlight

3 Data What data were received/processed/collected? Was it as expected? Please give brief details. Data from PIS and SMR01 were merged with an extract of data from the Aberdeen Maternity and Neonatal Databank. Yes the expected data were received.

4 Methodology How did you collect the data? Data were collected routinely How did you process the data? Using the statistical analysis plan How did you provision/publish the information? Yes (see above) Did your study scope change from its original aims? Please give brief details. We added information five-year-olds weight and height data as part of an amendment

5 Outcomes: The outcomes / results of your proposal. Please give brief details. We find that reduced early fetal size is present before obesity and asthma. In later pregnancy, increased fetal weight is associated with later obesity. **6 Future Questions:** Have the processes / results raised further questions for future exploration? Please give brief details. Yes. Aside from non communicable diseases we believe our results have highlighted the benefits and current limitations in linking routinely acquired data - linkage offers huge benefits to the population and data availability and integration of data from different sources can be further improved.

1516-0405 Dr Pia Hardelid

The hospital burden of influenza and other respiratory pathogens in children

End of Project Summary

No Summary. Data deletion record for the 1516-0405 data received.

A health informatics approach to the assessment of prescribing and clinical outcomes in bipolar disorder: national Scottish data linkage study

End of Project Report

The Public Benefit Impact Summary

1	Aims	
	What did the study set out to achieve?	<p>People with bipolar disorder often require long-term pharmacological treatment to prevent episodes of depression or mania. Lithium is considered one of the most effective treatments for bipolar disorder, and is recommended by the National Institute for Health and Care Excellence (NICE). However, prescribers often don't follow evidence-based guidelines, and data from some countries suggests use of lithium in bipolar disorder is in decline. We aimed to evaluate and describe prescribing patterns in bipolar disorder in Scotland between 2009 and 2016, in order to assess the most common drugs/drug combinations prescribed and any changes over this time period.</p>
2	Public Benefit Impact	

	<p>How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered.</p>	<p>This study showed that in Scotland between 2009 and 2016, up to a quarter of patients with bipolar disorder were receiving antidepressants as their only form of pharmacological treatment. This is concerning as treatment guidelines warn against use of antidepressants without an accompanying mood stabiliser for bipolar disorder. Prescribing of lithium declined from 2009 to 2016, despite this drug being recommended as a first-line treatment by NICE. These findings demonstrate a concerning gap between evidence-based guidelines and clinical practice for bipolar disorder in Scotland. The patterns we found could be due to changes in medical training, promotion of alternative treatments by the pharmaceutical industry, and changes in incentives for lithium monitoring.</p> <p>These important findings were featured in the Chief Medical Officer's updated National Guidelines for Monitoring Lithium in 2019. We hope that the publication of these findings will help to promote adherence among prescribers to evidence-based treatment guidelines for bipolar disorder in Scotland.</p>
3	Data	
	<p>What data were received/processed/collected?</p> <p>Was it as expected? Please give brief details.</p>	<p>We linked prescribing data to electronic Scottish Morbidity records to identify a cohort of 23,135 patients with a diagnosis of bipolar disorder who were prescribed psychotropic medication between 2009 and 2016.</p>
4	Methodology	

	How did you collect the data?	Linkage of Prescribing Information System data to Scottish Morbidity Records was performed by eDRIS. We then identified patients with ICD codes denoting a diagnosis of bipolar disorder, and examined which medications, if any, they were prescribed between 2009 and 2016, from the following categories: 1) Hypnotics/anxiolytics; 2) antipsychotics; 3) lithium; 4) valproate; 5) antidepressants; 6) anti-epileptics.
	How did you process the data?	For each year from 2009 to 2016, we identified each patient's most common form of pharmacological treatment. We then examined the top 10 most common forms of treatment (monotherapy or drug combinations), and using random effects logistic models we examined evidence for changes in prescriptions of each drug category over time.
	How did you provision/publish the information?	The findings were published in a peer reviewed article in the <i>British Journal of Psychiatry</i> .
	Did your study scope change from its original aims? Please give brief details.	No
5	Outcomes:	
	The outcomes / results of your proposal. Please give brief details.	We found that almost a quarter of the bipolar disorder cohort were treated with antidepressant monotherapy, while only 6% were receiving lithium monotherapy. These findings highlight a gap between evidence-based prescribing guidelines and clinical practice in Scotland.
6	Future Questions:	
	Have the processes / results raised further questions for future exploration? Please give brief details.	In future studies we hope to examine whether different pharmacological treatments in bipolar disorder are associated with different physical and mental health outcomes, e.g. self-harm, psychiatric hospitalisations, cardiovascular disease, diabetes.

Mortality and morbidity after burn injury in Scotland**End of Project Report****The Public Benefit Impact Summary**

1	Aims	
	What did the study set out to achieve?	This study aimed to explore the long-term effects of suffering a burn injury.
2	Public Benefit Impact	
	How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered.	These results will inform clinicians on the risk factors associated with increased harm following a burn injury and direct future therapeutic interventions.
3	Data	
	What data were received/processed/collected? Was it as expected? Please give brief details.	Nationally held data (SMR01, SMR04, PRS, NRS) and national network data (COBIS). Data was as expected.
4	Methodology	
	How did you collect the data?	Pre-existing national data that is already routinely collected.
	How did you process the data?	Linked by eDRIS.
	How did you provision/publish the information?	Planned publication in medical journals.
	Did your study scope change from its original aims? Please give brief details.	No
5	Outcomes:	
	The outcomes / results of your proposal. Please give brief details.	Factors associated with an increased death from burn injury include increasing size of a burn, increasing age and the presence of a smoke inhalation injury. The use of anxiolytic medications such as benzodiazepines also contribute to the risk

		<p>of death, a finding that has not been seen previously.</p> <p>Although burns predominantly affect males, female gender increased the risk of being prescribed drugs such as opioids or anxiolytics after a burn injury.</p> <p>Patients with previous drug and alcohol problems were also at increased risk of being prescribed such drugs.</p>
6	Future Questions:	
	<p>Have the processes / results raised further questions for future exploration? Please give brief details.</p>	<p>There is likely to be an increased risk of early death after initially surviving a burn injury, but this has not been compared to other similar pathologies. The next step is to compare the long term outcomes of patients that have suffered a burn injury to those with a similar hyperinflammatory condition such as acute pancreatitis.</p>

1516-0480 Prof Damien McElvenny

Cancer mortality and incidence in the British rubber industry - a 45 year follow-up

End of Project Summary

This study further clarified the nature of historic cancer mortality risks that existed in the British Rubber and Cable Manufacturing Industry. An assessment of current exposures in the industry related to those estimated to have occurred during the timeline for this study will determine to what extent workers currently employed in the industry are exposed to a mortality risk.

Aims

This study set out to better characterise the nature of the cancer risks that arose from working in the British rubber and cable manufacturing industry.

Data

This study used demographic data from workers aged 35 or over who were employed in the industry in 1968. It used this information to link with the NHSCRs in Scotland and in England and Wales to determine which of the workers had died, when and from what causes.

Methodology

Standardised mortality ratios and hazards ratios were calculated to determine the relative mortality risks experienced by the industry workforce.

Outcomes

For all causes, all malignant neoplasms, non-malignant respiratory diseases and circulatory

diseases, SMRs were significantly elevated, and also particularly for cancers of the stomach (SMR=1.26,95% CI 1.18 to 1.36), lung (1.25,95% CI 1.21 to 1.29) and bladder (1.16,95% CI 1.05 to 1.28). However, the observed deaths for leukaemia, non-Hodgkin's lymphoma (NHL) and multiple myeloma were as expected. Bladder cancer risks were elevated only in workers exposed to antioxidants containing 1-naphthylamine and 2-naphthylamine.

Exposure (lifetime cumulative (LCE))-response associations were found for N-nitrosomorphiline and all cancers (subdistribution HR (SHR) 1.48, 95% CI 1.39 to 1.57) and cancers of the bladder, stomach, multiple myeloma, oesophagus, prostate and pancreas, as well as for N-nitrosodimethylamine and all cancers (SHR 2.08, 95% CI 1.96 to 2.21) and cancers of the bladder, stomach, leukaemia, multiple myeloma, prostate and liver. LCE to the N-nitrosamines sum were associated with increased risks from all cancers (SHR 1.89, 95% CI 1.78 to 2.01) and cancers of the lung, non-Hodgkin's lymphoma and brain. LCE to rubber dust and fumes are associated with increased mortality from all cancers (rubber dust SHR 1.67, 95% CI 1.58 to 1.78; rubber fumes SHR 1.91, 95% CI 1.80 to 2.03) and cancers of the bladder, lung, stomach, leukaemia, multiple myeloma, non-Hodgkin's lymphoma, oesophagus, prostate, pancreas and liver.

1516-0489 Colin Simpson

Developing a national learning health system for asthma

The Public Benefit Impact Summary

1	Aims	
	What did the study set out to achieve?	Create a learning health system for asthma
2	Public Benefit Impact	
	How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered.	Feasibility pilot study – demonstrated linkage of pollution and health outcome data
3	Data	
	What data were received/processed/collected? Was it as expected? Please give brief details.	All data were processed via the safe haven
4	Methodology	
	How did you collect the data?	Via the eDRIS safe haven

	How did you process the data?	Via the eDRIS safe haven
	How did you provision/publish the information?	Internal funders report
	Did your study scope change from its original aims? Please give brief details.	No change
5	Outcomes:	
	The outcomes / results of your proposal. Please give brief details.	We were able to link past data on pollution exposure and health outcomes
6	Future Questions:	
	Have the processes / results raised further questions for future exploration? Please give brief details.	Scale to national level data.

1516-0526 David McCollum

Economic change and internal population dynamics: an innovative study of new Residential mobilities in Scotland

There was no impact or findings from this part of the project at all.

1516-0566 Dr. Andrea Woolner

The impact of birth-related perineal injury on future pregnancies: a Scottish population based cohort study

End of Project Summary

During vaginal delivery of a baby, the perineum (the area between the vagina and the anus) can sometimes be overstretched, resulting in tears or lacerations for the mother. These lacerations, known as perineal tears are classified into degrees according to their severity – with 3rd and 4th degree tears being the most severe and involving the anal sphincter / lower bowel. Third- and fourth-degree tears can cause women distressing symptoms such as leakage of stool or wind without their control and pain during sexual intercourse. Currently health professionals do not know the best way to manage future pregnancies for women who suffer third- or fourth-degree tears in their first pregnancy.

This study has directly provided more information for women and health professionals alike on the incidence and recurrence of third- and fourth-degree perineal tears in Scotland. This study is the first of its kind to provide precise risk information on third- and fourth-degree tears for women in Scotland in their second pregnancy using Scottish national data. This was a large population-based cohort study and as such also provides information for similar populations globally. Specifically, this study adds to the information available to women to allow them to make informed choices in a subsequent pregnancy following after a severe childbirth tear. The results of this study will inform clinical practice by providing more information to use for counselling women with a history of third- or fourth-degree tear. This study has provided vital information on risk factors for repeat tears in study of Scottish women. This is vital to help women and their health care professionals to plan a birth following an initial severe childbirth tear. This study may help inform patient information such as websites, leaflets as well as clinical guidance in the future.

The aim of the study is to understand and explore the impact these tears have on women's subsequent pregnancies and deliveries using a population sample from nationally recorded data in Scotland.

Specifically:

- a) To determine if women have a longer gap between pregnancies or are less likely to have another pregnancy after an initial third- or fourth-degree tear
- b) To determine the risk of having a second (recurrent) third- or fourth-degree tear after an initial childbirth perineal injury compared to women without a previous third or fourth degree tear
- c) To determine what factors may be linked to being at higher risk of having a second (recurrent) third- or fourth-degree tear after suffering such an injury in the first pregnancy

The study used routinely collected hospital data from national Scottish data from Information Services Scotland (ISD; <http://www.isdscotland.org>) investigating the consequences for a second pregnancy if the first birth was affected by third or fourth degree perineal tear. All hospital admissions in Scotland are recorded in large computerised databases called the Scottish Morbidity Records (SMR). Everyone registered with a general practice in Scotland is allocated a unique personal identification number called the community health index (CHI) number. Using this CHI number, it is possible to link all pregnancies occurring in the same woman so that we can study the effects of 3rd or 4th degree tears on any subsequent pregnancy in a geographically defined population. The data are all anonymised by ISD - without any names or dates of birth so that it is impossible to identify individuals. The Scottish database has been recording 3rd and 4th degree tears since 1996 and offered an ideal opportunity to compare the pregnancy and delivery information of women who suffered third- or fourth-degree tears to those who did not at a national level.

Data were obtained from ISD for all women with a first vaginal singleton (one baby) birth in Scotland between 1997 and 2010. This included all women who gave birth vaginally in a National Health Service (NHS) Scottish hospital. Eligible women were identified by the electronic Data Research and Innovation Service (eDRIS, a part of ISD Scotland). Women were included if they had a live born baby in their first pregnancy. Vaginal birth included spontaneous and operative (forceps or ventouse/vacuum assisted) vaginal birth. Women were included if they had information recorded of their perineal or vaginal trauma at time of birth. Women who had twins or higher multiples delivered vaginally in the first pregnancy were excluded. Women were followed up from 1998 to 2015 to identify any second pregnancies. Events in a second pregnancy were compared for women who suffered third- or fourth-degree tears in their first pregnancy to women who did not suffer such tears and who had a normal vaginal birth instead. These groups of women were then compared to determine a risk ratio for

the risk of a recurrent tear in a second pregnancy, as well as conception rate (having a second baby) and delay to the second pregnancy. The mode of delivery, gestation at birth and episiotomy use in the second pregnancy were also studied. A study was also carried out to look for risk factors associated with repeat third- or fourth-degree tears in a second pregnancy. We used information on factors which might affect a woman's risk of having a third- or fourth-degree tear such as having a large baby, her age, body mass index and socioeconomic deprivation and standard statistical tests to answer our study objectives.

The study was presented at two international conferences: British Maternal and Fetal Medicine Society conference (BMFMS) 2018 in Brighton and the Royal College of Obstetricians and Gynaecologists (RCOG) World Congress 2019 in London as a poster presentation to share our results with clinical, research and patient stakeholders.

The study results have also been published in a globally recognised open access journal PLoS ONE (Reference: Woolner A, Ayansina D, Bhattacharya S, Black M. The impact of initial Third- or Fourth-Degree Tear on the Second Pregnancy: A Cohort Study of 182,445 Scottish Women. PLoS One. 2019 Apr 11;14(4):e0215180. doi: 10.1371/journal.pone.0215180).

Outcomes

Third- and fourth-degree tears (severe perineal tears) are becoming more common in first and second vaginal births in Scotland. Women do not appear to delay future childbirth following an initial third- or fourth-degree tear. There were 2.5% less second pregnancies for women with an initial third- or fourth-degree tear. However, after statistical testing and adjusting for factors which may affect reasons for having a second baby such as a woman's age this was not found to be significantly different compared to women who did not have a severe tear in their first pregnancy. Having an initial third- or fourth-degree tear does not influence the time gap to a second pregnancy.

Women with an initial third or fourth degree were however twelve times more likely to have an elective caesarean section in a second pregnancy. We were unable to tell if this was specifically because of their initial severe tear due to the limitations of the data available however it is a striking difference compared to women who did not have a severe perineal tear with their first baby.

6.6% of women who had a third- or fourth-degree tear at their first birth also had a third- or fourth-degree tear in their second vaginal birth (excluding women who had caesarean section for their second birth). Women with an initial third- or fourth-degree tear who opted for a vaginal birth in the second pregnancy were six times more likely to have a repeat third- or fourth-degree tear than women who did not have a severe tear at their first birth.

Episiotomy use was greater in the second vaginal birth for women with prior third- or fourth-degree tear compared to women who did not have a severe tear in their first vaginal birth. Increasing maternal age and a baby's birthweight of ≥ 4500 g were associated with an increased risk of repeat third- or fourth-degree tears.

In summary, third- and fourth-degree tears are an increasing obstetric issue and appear to affect subsequent mode of delivery. Methods to prevent or predict these injuries needs to be prioritised.

Future Questions:

This study has emphasised the need to study women's views and values after having an initial third- or fourth- degree tear. Why many women appear to opt for a planned caesarean section

following a severe perineal tear needs to be explored. This study will contribute to a review of all similar studies from across the world to combine their results to provide women with even stronger evidence to help them make important decisions about their future birth options after an initial third- or fourth-degree tear. The results of this study will inform future research to develop methods of predicting a woman's risk of repeat third- or fourth-degree tear.

[1516-0595 Sarah Stock](#)

QUIDS – Quantitative Fibronectin to help Decision making in women with symptoms of Preterm labour

End of Project Summary

End of project declaration received, no summary.

[1516-0597 Paul Welsh](#)

An assessment of the efficacy and cost effectiveness of routine measurement of high-sensitivity troponin T and troponin I to predict cardiovascular events

End of Project Summary

Public Benefit Impact

This study provides the evidence that addition of blood troponin I measurement to existing cardiovascular disease risk prediction scores would improve treatment decisions, helping prevent heart attacks and strokes. In contrast, our findings suggest troponin T does not achieve these goals. Our findings provide clear evidence to clinical decision makers about what troponin should be measured in this setting in clinical practice, thus benefiting patient care. The study also provides important new information about “usual” population levels of these troponin tests. Our results may help guide the development of the next set of Scottish clinical guidelines for CVD prevention (SIGN guidelines); Dr Priess

and Prof Sattar were involved in the development of the latest such guidelines (SIGN 149). Our results are being used to plan an application to measure troponin and other cardiac biomarkers in the UK Biobank resource, and to plan trials into CVD risk prediction improvement. Finally, the study provides a platform for further study of the causes of troponin elevation in the general population.

Aims

Our overall objective was to investigate whether incorporating the measurement of high sensitivity troponin in routine cardiovascular risk estimation in Scotland, based on the ASSIGN risk score, improves risk stratification.

Data

Volunteers from the Generation Scotland Study had previously consented to have their original study data linked to hospitalisation events, and information about deaths. We extracted data on dates of hospitalisation for reasons related to cardiovascular disease, and dates and causes of death, for participants in the study March 2017.

Methodology

We used a firewall system to divorce personally identifiable NHS CHI numbers from the data analysis phase of the study. A separate health informatics centre undertook linkage of study participant identifiers (anonymised numbers) with identifiable patient NHS numbers. We then received the data linking study IDs to health outcome, without ever accessing the CHI numbers or identifiable information for participants ourselves. Analysis was conducted on an encrypted data Safehaven (from which data cannot be downloaded). The data linking study IDs to health outcomes was then deleted.

Outcomes

The findings have been published in *Circulation*, and *Clinical Chemistry (Internationally recognised and field leading journals)*. The data have been presented at International meetings including American Heart Association. The data have also been presented to the Chief Scientist Office Public Engagement Group.

Psychiatric illness and physical chronic disease co-morbidity in Scotland: a feasibility and pilot study

End of Project Summary

1	Aims	
	What did the study set out to achieve?	<p>The project aimed to: investigate the occurrence major physical health conditions (including diabetes, ischaemic heart disease, stroke and cancer) in people with versus without severe mental illness: and compare the mortality of people with versus without severe mental illness. The rationale for the work was two-fold: 1. to examine the association between severe mental illness and physical disease incidence (information on which was lacking in Scotland); and 2. to establish the usefulness and robustness of routinely collected mental health data in Scotland (which at the point of application had been relatively little used in research) in order to form a foundation for subsequent planned work focused on severe mental illness and complications of physical disease.</p>
2	Public Benefit Impact	

	<p>How will these outcomes directly result in benefit for the public? Please give details. This should be the main section answered.</p>	<p>This research will contributed to building a solid epidemiological foundation from which to direct/inform research on mental-physical health co-morbidity. This work has led to multiple major funded research projects that have identified mental illness disparities physical disease outcomes and in delivery/receipt of care, some of which investigate the underlying reasons for these observed disparities. This major programme of work has contributed valuable and novel knowledge on the interplay between mental and physical disease, providing valuable insight on this in the Scottish setting in particular. This research has highlighted major mental health disparities with important implications for clinicians and policy makers. They will help inform intervention strategies/policies/service provision changes to provide better care for the physical health of mentally ill patients, as well as directing further research in this area. Ultimately, results will be used to improve the physical health of people with mental illness.</p>
3	Data	
	<p>What data were received/processed/collected?</p> <p>Was it as expected? Please give brief details.</p>	<p>We received data extracts from SMR01, SMR04, SMR06, NRS Mortality data, SMR00, PIS and SCI-Diabetes. The data extracts were largely as expected, but we did encounter issues with some extracts where there were inaccuracies/missing data. These were resolved with the eDRIS analyst who conducted some of the analyses for the project.</p>

4	Methodology	
	How did you collect the data?	We were provided with data extracts from eDRIS
	How did you process the data?	We processed the data using R software within the National Safe Haven
	How did you provision/publish the information?	We have published two articles in international peer-reviewed journals, two further articles are under journal peer-review and a fifth article is in preparation.
	Did your study scope change from its original aims? Please give brief details.	The initial scope included assessment of the concordance between multiple overlapping sources of information on mental health status. This included assessing the utility of the SMROO and PIS datasets in ascertaining/defining mental illness status. However, resources in terms of analyst time and funding meant that we were unable to investigate these datasets to assess their utility in this context.
5	Outcomes:	
	The outcomes / results of your proposal. Please give brief details.	<p>Our findings demonstrated:</p> <ol style="list-style-type: none"> 1. Severe mental illness (schizophrenia, bipolar disorder and major depression) is associated with a marked increased incidence of ischaemic heart disease, stroke, diabetes and cancer 2. There are differences in the magnitude of the associations between severe mental illness and these physical health conditions, with variations by mental disorder and (for some physical conditions) age, sex and/or deprivation status 3. Severe mental illness disparities in physical disease incidence have persisted over the past 20-30 years, with no narrowing of the gap 4. Major depression is associated with a marked excess mortality rate, with analyses of cause-

		<p>specific death highlighting: the staggering excess risk of unnatural deaths; the varying contribution of different natural causes of death to the overall excess mortality; few differences between males and females in mortality findings</p> <p>5. No change in the life expectancy gap for people with bipolar disorder and major depression and a possible widening of the life expectancy gap for people with schizophrenia.</p>
6	Future Questions:	
	<p>Have the processes / results raised further questions for future exploration? Please give brief details.</p>	<p>The results revealed mental health disparities in physical disease occurrence and mortality. These findings raised questions about whether the outcomes of these physical conditions differed in people with versus without severe mental illness, and the extent to which there were differences in delivery/receipt of care. This work directly informed subsequent studies, including four funded research projects awarded to the applicant of this project (CSO project grant, 2017-2019, CSO project grant 2022-2024, RCGP SFB project grant, 2022-2023 and BHF Data Science Centre award 2023). Each of these projects focus on severe mental illness in relation to the outcomes from and clinical care for diabetes, heart disease and/or stroke.</p>