Healthy services and safer patients: links between patient suicide and features of mental health care providers

National Confidential Inquiry into Suicide and Homicide by People with Mental Illness

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The Healthcare Quality Improvement Partnership (HQIP) is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. HQIP's aim is to promote quality improvement, and it hosts the contract to manage and develop the Clinical Outcome Review Programmes, one of which is the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness (NCISH), funded by NHS England, the Scottish Government, NHS Wales, the Northern Ireland Department of Health, Social Services and Public Health (DHSSPS) and the State of Jersey. The programmes, which encompass confidential enquiries, are designed to help assess the quality of healthcare, and stimulate improvement in safety and effectiveness by systematically enabling clinicians, managers and policy makers to learn from adverse events and other relevant data. More details can be found at: www.hqip.org.uk/clinical-outcome-review-programmes-2/

REPORT SUMMARY

Background to this study

Our previous work found that specific service changes were associated with improved patient suicide rates, e.g. introducing 24-hour crisis teams, policies for patients with dual diagnosis, and multidisciplinary reviews after a suicide.

The recent Francis and Berwick reports have highlighted how patient safety may be related to the healthy functioning of the organisations that provide care.

How does this study build on our previous work?

This study extends our earlier work by examining how patient suicide rates relate to:

- additional features of mental health care provision
- the health of the provider organisations themselves.

How we carried out the study

Information was collected in three main categories:

1. staff data (e.g. staff turnover)
2. patient data (e.g. written complaints)
3. service configuration data (e.g. average length of admission).

Information was collected via a number of different sources available in the public domain, e.g. NHS staff and patient surveys, annual reports from service providers, national datasets such as the Mental Health and Learning Disabilities Data Set (MHLDDS).

Data on patient suicides were collected as part of NCISH. We obtained UK national data for all suicides and identified those who were patients through service provider records.

Associations between service features and suicide rates were examined for the period 2010-2012.

We also examined associations between changes in features of organisations and in patient suicide rates over a longer time period, i.e. 2004-2012.

Key findings

- Higher suicide rates were associated with:

  ◊ higher non-medical staff turnover
  ◊ higher rates of patient complaints
  ◊ more patient safety incidents overall
  ◊ higher rates of detained in-patients
  ◊ higher rates of prescriptions of psychotropic drugs
  ◊ higher levels of medical consultant and psychiatric nurse staffing.

- There were no associations between patient suicide and staff sickness or staff satisfaction.

- There were also no associations between suicide and patient satisfaction scores, being under the Care Programme Approach (CPA), average length of hospital stay, or admission waiting time.

- As this is an observational study, we can not establish cause and effect between service features and suicide rates. Some associations (e.g. with staff numbers and prescription rates) are likely to reflect greater needs in the local population.

Key messages for services

1. The health of mental health provider organisations may have an impact on the safety of patients.

2. Patient complaints and staff turnover may be markers of patient suicide risk; high or rising rates for these factors should act as a safety alert to services and commissioners.

3. The link between non-medical staff turnover and patient suicide could be causal; suicides may be more likely when there is a lack of continuity in care. Services should aim to reduce staff turnover.

4. Services are often unsure whether to attach significance to a rise in suicide in a single year. An accompanying rise in safety incidents overall should raise concerns.

5. Higher rates of complaints and safety incidents are sometimes taken as evidence of an open reporting culture; our findings suggest they may also reflect real safety concerns.

INTRODUCTION

Mental illness and suicide

- The National Confidential Inquiry into Suicide and Homicide by People with Mental Illness (NCISH) is a unique UK-wide database of all suicides by people in contact with mental health services in the previous 12 months. Much of what we know about suicide in the mental health patient population in the UK is derived from NCISH data.

- NCISH work has influenced mental health practice and policy in making recommendations that will reduce the risk of patients dying by suicide.

- Around a quarter of people who die by suicide in the UK have been in contact with mental health services within a year before death. This equates to an average of 1,638 patient suicides per year between 2002-2012.[1]

- Key characteristics of patient suicide are monitored by NCISH and presented in annual reports, the latest of which is available at: http://www.bbmh.manchester.ac.uk/cmhr/research/centreforsuicideprevention/nci/reports/Annualreport2014.pdf.

Features of services and suicide rates

- Improvements to mental health services can contribute to the prevention of suicide. For example, changes to the physical environment on wards can lead to fewer in-patient deaths by hanging.[2] We have previously shown a link between implementation of key NCISH recommendations and a fall in patient suicide rates.[3,4] Particular recommendations associated with falls in suicide rates were introducing 24-hour crisis teams, policies for patients with dual diagnosis, and reviewing care after a suicide has occurred.

- We also found services that had implemented a majority of NCISH recommendations had greater falls in suicide rates than services that had implemented few. Individual service changes had an impact on particular groups. For example, assertive outreach was linked to fewer suicides in patients refusing treatment or losing contact with services. Early follow-up after hospital discharge was linked to fewer suicides in the first three months after returning home.

KEY FINDINGS OF PREVIOUS NCISH SERVICE STUDIES [3,4]

- A number of service changes were associated with falling suicide rates, particularly introducing 24-hour crisis teams, policies for patients with dual diagnosis, and multidisciplinary review after a suicide.

- Services that implemented the majority of recommendations or service changes had lower suicide rates.

- Individual service changes had an impact on particular patient groups (e.g. removal of non-collapsible curtain rails reduced in-patient suicide).

- The Francis[5] and Berwick[6] reports have highlighted the impact on safety of how a healthcare organisation functions. In these reports, evidence of safety may be seen in the health of the provider organisation itself, in features such as staff turnover and complaint handling.[7]

- One study has found associations between healthcare characteristics and patient outcomes, e.g. staff perception of quality of care in relation to hospital mortality rates.[8] However, no studies have assessed service features in relation to patient suicide rates.

Study objectives

- In the current study we aimed to examine whether patient suicide is related to:

  (1) features of how mental health services function

  (2) the health of the provider organisations themselves.

METHODS

Information on patients who die by suicide

- Suicides were defined as deaths that received a suicide or open verdict at coroner's inquest, as is conventional in research and national statistics.
- Suicide data were collected as part of NCISH for individuals aged 10 and above who died by suicide between Jan 1, 2004 and Dec 31, 2012. This time period was selected because of the availability of data on the organisation of services.
- A full description of NCISH data collection processes can be found elsewhere.[9] In brief:
  - ◊ NCISH obtains national data for all suicides irrespective of mental health care contact
  - ◊ those who were patients, i.e. in contact with mental health services, are identified with the help of mental health trust records
  - ◊ a detailed questionnaire is sent to the mental health team responsible for the care of the patient prior to suicide.

Data collection

- We collected information from each NHS mental health service in the UK in three main categories:

  1. staff data
  2. patient data
  3. service configuration data.

- The individual features investigated within each category are shown in **Table 1**.
- Staff turnover is classified into three groups as provided by the Office for National Statistics Workforce Statistics: medical consultants, nursing staff, and non-medical staff. Non-medical staff includes nurses, qualified allied health professions and other qualified scientific, therapeutic and technical staff.
- Staff engagement is defined by the NHS National Workforce Projects (2007) as "a measure of how people connect in their work and feel committed to their organisation and its goals". It is measured in the NHS Staff Survey as one aspect of staff satisfaction.

METHODS SUMMARY

- The aim of this study was to examine service and organisational features in relation to patient suicide rates in the UK.
- Three main areas were assessed:

  1. staff data
  2. patient data
  3. information on service configuration.

- Data sources were those available in the public domain and included annual reports, NHS staff and patient surveys, and national databases of hospital activity, e.g. the Mental Health and Learning Disabilities Data Set (MHLDDS).
- The number and rate of suicide was calculated for each service.
- Correlations between service features and suicide rates were examined.
- Where available, features of organisations and suicide rates were examined over time.

- We also collected data on social factors in the areas where the mental health services were situated, including unemployment levels and social deprivation.

Data sources

- Data were collected from a number of different sources listed in **Appendix A.**
- In order to calculate rates, we obtained denominator data on the number of people seen by mental health services. We used data from national datasets including the Mental Health and Learning Disabilities Data Set (MHLDDS)[10], StatsWales[11], ISD Scotland[12], as well as National Confidential Inquiry data.
- The data collection method used by the MHLDDS changed between 2010/11 and 2011/12 meaning denominator figures for England were not comparable over time. We addressed this by estimating what the denominators would have been if there had been consistent data collection.

METHODS (CONT'D)

Table 1: Staff, patient, and service configuration features investigated in this study

Service features
Staff
Staffing: - Number of psychiatric consultants per 10,000 mental health contacts - Number of psychiatric nurses per 10,000 mental health contacts - Staff sickness (% days lost to sickness)
Staff satisfaction: - Overall engagement score (score 1-5 with 5 being the most engaged and 1 being the least engaged) - Staff satisfied with quality of work and care (%)
Staff turnover (% of leavers and new joiners): - Consultants - Nursing staff - All non-medical staff†
Patients
- Number of written complaints per 10,000 mental health contacts - Patient satisfaction (% overall satisfaction score)
Service configuration
- Number of patients detained under the Mental Health Act per 10,000 mental health contacts - Number of patients under the Care Programme Approach per 10,000 mental health contacts - Average length of hospital stay (days) - Average admission waiting time (days)
Prescriptions (number prescribed per 10,000 mental health contacts): - Antidepressants - Psychoses & related disorders - Substance dependence - Hypnotics & anxiolytics
- Number of patient safety incidents per 10,000 mental health contacts - Bed occupancy (% of daily beds available which are occupied)
† All non-medical staff include nursing staff, qualified allied health professions and other qualified scientific, therapeutic and technical staff

Analysis

Cross-sectional analysis

- Our aim in this analysis was to identify associations between service features and suicide rates in a recent time period.
- We combined data for the years 2010-2012 and looked at the relationship between suicide rates and features of services and provider organisations during this three-year period. Suicide rates were calculated per 10,000 mental health service users.
- We analysed how well these sets of data were related using Spearman's correlation. Wider social factors could influence the relationship between service factors and suicide rates, therefore we adjusted the analysis to take account of deprivation level and unemployment.

Longitudinal analysis

- We assessed whether changes in service features over several years related to changes in patient suicide rates.
- The length of time analysed varied by individual service and by UK country. For example, the feature for which data were available for the longest time period was staff numbers (consultants or nurses) between 2004-2012. The shortest was prescription data in Northern Ireland (available between 2011-2012). The suicide rate was calculated using the number of mental health contacts for each year for each service as the denominator.
- We examined longitudinal trends using Poisson regression mixed modelling. We split each service characteristic into three groups (tertiles) and compared the suicide rate between the three groups using the incidence rate ratio (IRR). An IRR which is greater than 1.0 suggests an increased risk of suicide; an IRR lower than 1.0 suggests a decreased risk. 95% Confidence Intervals (CIs) were calculated, giving an indication of the precision of our findings.

FINDINGS

Data collection

Between 2004 and 2012 we were informed of 13,960 people who had died by suicide within 12 months of being seen by mental health services. This represented 27% of all suicide deaths (52,075) that occurred in the UK during the same time period.

There were:

- 10,526 suicide deaths in England (in 62 services)
- 607 suicide deaths in Northern Ireland (in 5 services)
- 2,188 suicide deaths in Scotland (in 14 services)
- 639 suicide deaths in Wales (in 7 services).

1. Relationship between patient suicide rates and features of services

- **Table 2** shows the associations between service features and suicide rates in the period 2010-2012.

Staff features

- Higher levels of medical staffing (consultants) and psychiatric nurse staffing were associated with higher suicide rates. This is unlikely to be a causal relationship. It is more likely to reflect larger services having more people at risk in their catchment populations and responding by increasing staff numbers.

- There was an association between a higher turnover of non-medical staff combined (including nursing staff and other qualified therapeutic staff) and higher suicide rates **(Figure 1)**. The association with nurses alone was of borderline significance.

- There was no significant relationship between suicide rates and staff sickness, staff satisfaction, or turnover of consultants.

Patient features

- There was an association between the rate of patient safety incidents more generally and suicide rates **(Figure 2)**.

- In this analysis there was no association between the rate of written patient complaints and suicide rates.

- Overall patient satisfaction score was not associated with suicide rates.

Figure 1. Correlation between all non-medical staff turnover (%) and the suicide rate (per

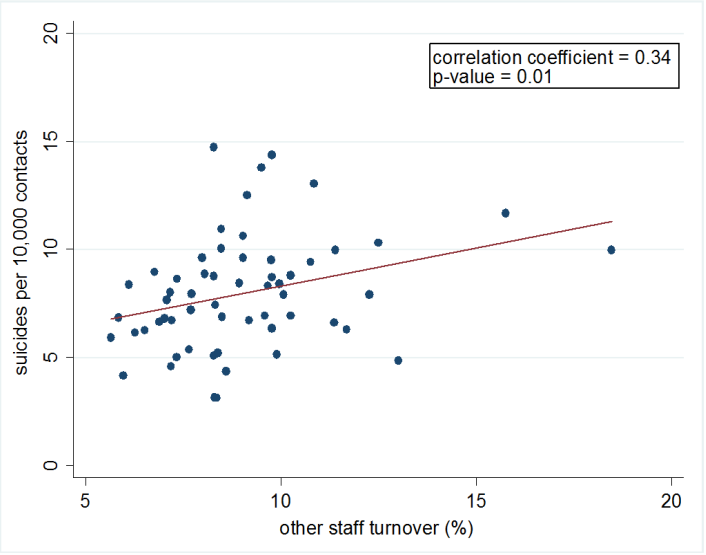


Figure 2. Correlation between the rate of patient safety incidents and the suicide rate (per 10,000 contacts)

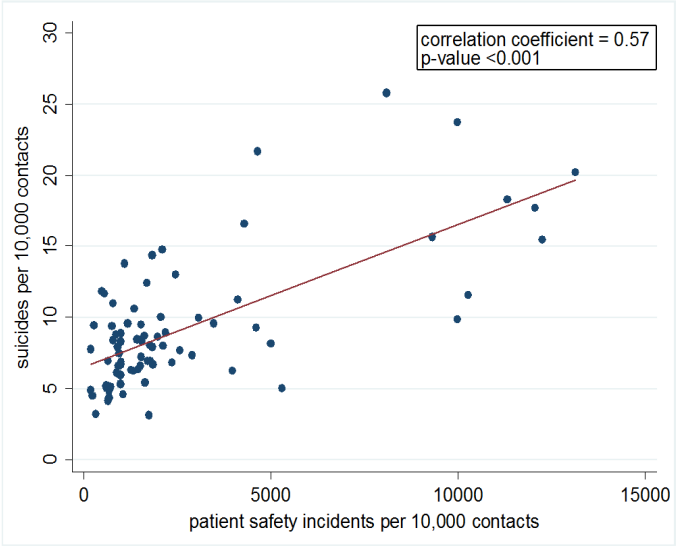


Table 2. Correlations between service features and suicide rates (per 10,000 contacts with mental health services) 2010-2012

Service feature	Number of service providers included in analysis	Correlation (p-value)
Staff		
Psychiatric consultants	86	**0.43 (<0.001)**
Psychiatric nurses	66	**0.39 (0.001)**
Staff sickness	87	-0.07 (0.53)
Staff satisfaction		
Overall engagement score	85	0.07 (0.53)
Staff satisfaction with quality of work & care	60	-0.11 (0.41)
Staff turnover†		
consultant	58	-0.02 (0.88)
nursing staff	58	0.24 (0.07)
all non-medical staff	58	**0.34 (0.01)**
Patients		
Complaints		
Written complaints	86	0.19 (0.09)
Patient satisfaction		
Overall care score	80	-0.02 (0.88)
Service configuration		
In-patients detained under the Mental Health Act	85	**0.35 (0.001)**
Patients under the Care Programme Approach	60	0.24 (0.07)
Average length of hospital stay	85	-0.15 (0.18)
Average admission waiting time	59	0.07 (0.58)
Prescriptions for mental illness		
Antidepressants	85	**0.60 (<0.001)**
Psychoses & related disorders	85	**0.43 (<0.001)**
Substance dependence	85	**0.33 (0.002)**
Hypnotics & anxiolytics	85	**0.53 (<0.001)**
Patient safety incidents	80	**0.57 (<0.001)**
Bed occupancy	84	-0.17 (0.12)

† fewer providers as England only. All non-medical staff include nursing staff, qualified allied health professions and other qualified scientific, therapeutic and technical staff

Service configuration features

- Services with higher proportions of patients detained under the Mental Health Act (MHA) had higher suicide rates. Both detentions and suicides are likely to reflect more severely ill patient populations.
- There were no associations between suicide rates and the rate of patients under the Care Programme Approach (CPA), average length of hospital stay, or admission waiting time.

Prescriptions

- Rates of all types of prescriptions for mental illness were highly positively correlated with suicide rates. This does not mean medication causes suicide, it is more likely to show that drug treatments are used more in treating people at high risk.

Adjustment for social context variables

- Adjusting for deprivation and unemployment made little difference to the correlations.

2. Patient suicide rates and changes in services over several years

- The cross-sectional analysis examined service features and suicide rates at one point in time. We also carried out a second, longitudinal analysis to assess whether changes in service features over time related to changes in patient suicide rates. This took into account the suicide rate for each year of the study.
- The analysis was based on data for the years 2004-2012, although levels of data availability varied for different service features.
- The main findings were broadly consistent with the cross-sectional analysis, as outlined below.

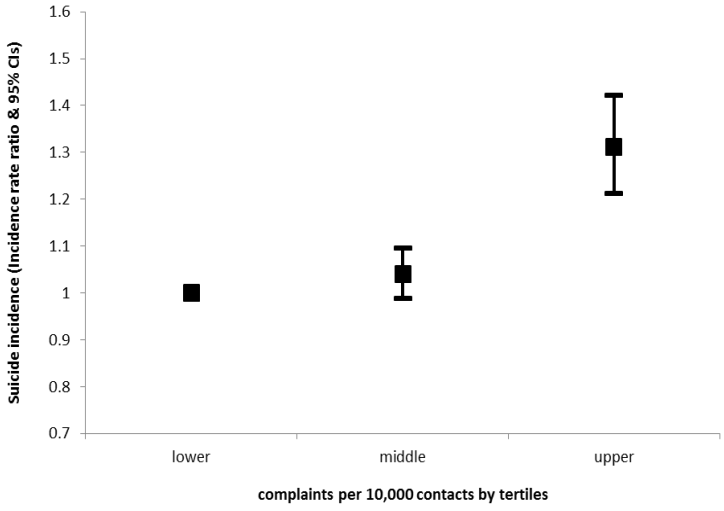
Staff features

- Increases in rates of medical consultant staffing and mental health nurse staffing were associated with increased suicide rates.

Patient features

- The rate of suicide was around 30% higher in services with high rates of written patient complaints (**Figure 3)**.

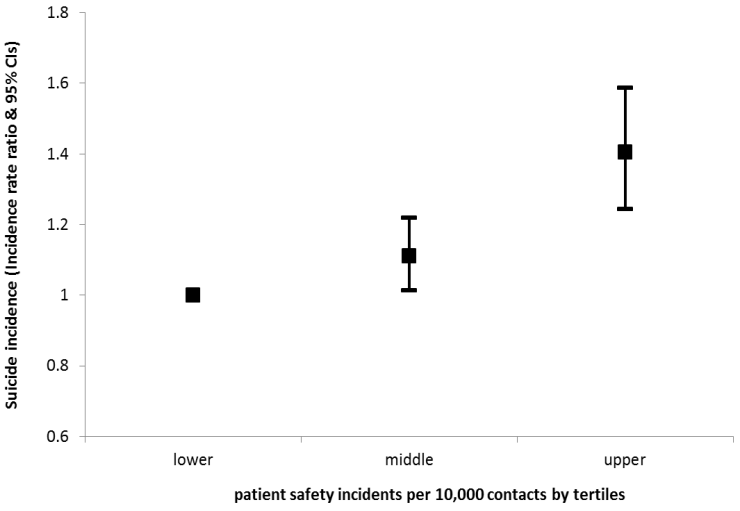
Figure 3. Incidence rate ratios for suicide by rate of written patient complaints



Service configuration features

- Services which had the highest rate of patients detained under the Mental Health Act had higher suicide rates.
- Increased rates of prescriptions for all types of psychotropic drugs were associated with higher suicide rates.
- The rate of patient suicide was 40% higher in services with high rates of patient safety incidents **(Figure 4)**.

Figure 4. Incidence rate ratios for suicide by rate of patient safety incidents



DISCUSSION

Main findings

- We found a number of associations between features of mental health provider organisations and patient suicide rates. Some of these were aspects of the way services function, others were features of the organisations themselves.

- We found higher patient suicide rates to be associated with:

  ◊ higher non-medical staff turnover
  ◊ higher rates of complaints
  ◊ higher patient safety incidents overall
  ◊ higher rates of in-patient detention under the MHA
  ◊ higher rates of prescriptions of psychotropic drugs
  ◊ higher staffing levels for medical consultants and mental health nurses.

- We did not find an association between patient suicide and staff sickness rates, staff satisfaction or patient satisfaction with care, length of stay or bed occupancy.

- An observational study of this kind can not show that the effect of factors associated with suicide is causal. However, these factors may be useful as markers of suicide risk. Some may reflect an organisational response to high risk, e.g. increased staffing or drug prescriptions in services with more severely ill patients. Alternatively, larger services could have more at risk local populations.

- Staff turnover could be a marker of a feature related to safety such as poor leadership or peer support, or it could result from staff concern about the care they are asked to provide. However, the link between high staff turnover of non-medical staff and patient suicide could be causal in that frequent changes of staff could disrupt the continuity of care of vulnerable patients.

- These potential markers of risk could inform future service development through inclusion in quality improvement tools and benchmarking (see the NCISH website for our safer services self-assessment toolkit: http://www.bbmh.manchester.ac.uk/cmhr/research/centreforsuicideprevention/nci/toolkits).

Limitations

- This was an observational study examining associations between service features and suicide rates. We cannot establish cause and effect.
- For example, we cannot say high staff turnover caused high suicide rates, although it is possible. Equally, high suicide rates could lead staff to leave, or both suicide rates and staff turnover could be linked to a third factor, e.g. changes in service configuration.
- We used data routinely available; quality and availability varied between services. Some data were collected from a variety of sources and were not always consistent.
- Changes in service context meant we were unable to include data from certain services, e.g. services experiencing boundary changes were excluded from our analysis.

Research Implications

- Future studies might examine a wider range of features such as those related to staff training.
- Studies could also explore the potential mechanisms for the association between organisational factors and suicide.
- Future work should explore the extent to which service features are modifiable and which might be markers of safety in their own right.

KEY MESSAGES

1. The health of mental health provider organisations may have an impact on the safety of patients.

2. Patient complaints and staff turnover may be markers of patient suicide risk; high or rising rates for these factors should act as a safety alert to services and commissioners.

3. The link between non-medical staff turnover and patient suicide could be causal; suicides may be more likely when there is a lack of continuity in care. Services should aim to reduce staff turnover.

4. Services are often unsure whether to attach significance to a rise in suicide in a single year. An accompanying rise in safety incidents overall should raise concerns.

5. Higher rates of complaints and safety incidents are sometimes taken as evidence of an open reporting culture; our findings suggest they may also reflect real safety concerns.

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Appendix A: Sources of information used to collect data on service

Service feature	Source
STAFF	
Staff numbers	HSCIC,[13] ISD Scotland, DHSSPNI,[14] StatsWales, Annual reports
Staff sickness	Annual reports, HSCIC, StatsWales, DHSSPSNI, ISD Scotland
Staff satisfaction	Annual reports, CQC,[15] NHS Staff Survey, HSCNI Staff Survey,[16] NHS Scotland[17]
Staff turnover	HSCIC (England only)
PATIENTS	
Patient satisfaction	Annual reports, CQC, NHS Scotland, DHSSPSNI
Patient complaints	Annual reports, HSCIC, StatsWales, ISD Scotland, DHSSPSNI
SERVICE CONFIGURATION	
Number in contact with mental health services	MHLDDS, ISD Scotland, StatsWales, DHSSPSNI
Number detained under the Mental Health Act	MHLDDS, ISD Scotland, Mental Welfare Commission for Scotland,[18] StatsWales, DHSSPSNI
Length of hospital stay	MHLDDS, ISD Scotland, StatsWales, DHSSPSNI
Bed occupancy	NHS England, MHLDDS, ISD Scotland, StatsWales, DHSSPSNI
Prescriptions of psychotropic drugs	HSCIC, ISD Scotland, StatsWales, HSCNI
Number of patient safety incidents	HSCIC, ISD Scotland, StatsWales, DHSSPSNI
SOCIAL CONTEXT	
Unemployment	ONS 2011 Census[19]
Deprivation	Dept. for Communities and Local Government (IMD),[20] the Scottish Government,[21] the Welsh Government,[22] NISRA[23]

Key:

CQC	= Care Quality Commission
DHSSPNI	= Department of Health, Social Services and Public Safety Northern Ireland
HSCIC	= Health and Social Care Information Centre
HSCNI	= Health and Social Care Northern Ireland
IMD	= Index of Multiple Deprivation
ISD Scotland	= Information Service Division Scotland
MHLDDS	= Mental Health and Learning Disabilities Data Set
NISRA	= Northern Ireland Statistics and Research Agency
ONS	= Office for National Statistics

Appendix B: Membership of the Independent Advisory Group (IAG) for the Mental Health Clinical Outcome Review Programme

Ben Thomas (Chair), Director of Mental Health and Learning Disability Nursing, Department of Health, England

Richard Bunn, Consultant Forensic Psychiatrist, Belfast Trust, Shannon Clinic, Northern Ireland

Jeremy Butler (lay representative), Non-executive Director at the National Patient Safety Agency and the Berkshire Healthcare NHS Trust, retired pilot and General Manager for British Airways, advisor to Boeing on aircraft accidents

Jonathan Campion, Visiting Professor of Population Mental Health, University College London; Director of Population Mental Health, UCL Partners; Director for Public Mental Health and Consultant Psychiatrist, South London and Maudsley NHS Foundation Trust

Mick Dennis, Professor of Psychiatry for Older People & Honorary Consultant Psychiatrist, Swansea University and Abertawe Bro Morgannwg University Health Board, Swansea

Michael Holland, Consultant Psychiatrist and Associate Medical Director for Revalidation and Quality at South London and Maudsley NHS Foundation Trust

Sarah Markham (lay representative), Member of HQIP Service User Network and Consultant Outcomes Programme advisory group

Ian McMaster, Medical Advisor, Department of Social Services and Public Safety (DHSSPS), Northern Ireland

John Mitchell, Principal Medical Officer for General Psychiatry, Mental Health and Protection of Rights Division, Scottish Government

Jenny Mooney, Director of Operations, National Clinical Audit and Patient Outcome Programmes, HQIP

John Morgan, Consultant General Adult Psychiatrist, Leeds and York Partnership Foundation Trust

Sian Rees, Interim Director, University of Oxford Health Experiences Institute, Department of Primary Care Health Sciences

Geraldine Strathdee, National Clinical Director for Mental Health, NHS England, Consultant Psychiatrist