

Changing prescribing patterns in an Irish community mental health service

R. Rowntree¹, N. McCarthy¹ and L. Feeney^{2*}

¹ Cluain Mhuire Community Mental Health Service, Blackrock, Dublin, Ireland

² Cluain Mhuire Community Mental Health Service and Royal College of Surgeons in Ireland, Blackrock, Dublin, Ireland

Objectives. Medication is an important component of the treatment of many mental illnesses. Very little information is available about the particular medications that are being prescribed by community mental health services and how this has changed over time. We set out to obtain details of psychiatric medications being prescribed by one Irish community mental health service.

Method. All prescribing by the Cluain Mhuire Community Mental Health Service became electronic during 2004. Using Business Intelligence software, we obtained details of all psychiatric medications prescribed from 2005 to 2016. We compared numbers of prescriptions written in the first 6 years (2005–2010) with the following 6 (2011–2016).

Results. Olanzapine was the most commonly prescribed medication throughout but its use declined by one-quarter over the study period. Clozapine, quetiapine, aripiprazole and haloperidol prescribing increased. Prescriptions for mood stabilisers and antidepressants fell by 25%. Sedative prescriptions declined by almost 50%. Absolute numbers of prescriptions written for methylphenidate and pregabalin were small but increased dramatically over the time period.

Conclusions. This community mental health service prescribed less of most psychiatric medications in 2016, than had been the case in 2005. This is despite an increase in the numbers of patients seen over the same period. It is not clear if this pattern is echoed in other services.

Received 14 June 2017; Revised 19 September 2017; Accepted 20 September 2017; First published online 06 November 2017

Key words: Community mental health, medication, mental illness, psychiatry, side effects.

Introduction

Psychiatric medication is an essential component of the treatment of many mental health conditions (Cowen *et al.* 2012). Prescribing practices change in response to the development of new efficacy evidence; the emergence of previously poorly understood side effects; the appointment of new doctors; the influence of key opinion leaders; the marketing of new agents; cost and a myriad of other factors (Rosholm *et al.* 1997; Pincus *et al.* 1998; Kaye *et al.* 2003; Hamann *et al.* 2004; Jureidini & McHenry, 2009; Mars *et al.* 2017). The prescribing of psychiatric medications, particularly antidepressants, has been increasing over the past 20 years (Ilyas & Moncrieff, 2012; Mars *et al.* 2017).

In Ireland primary care doctors prescribe the majority of antidepressant and sedative medications and the proportion of the Irish population using these medications grew between 2006/2007 and 2010/2011 (NACD & PHIRB, 2012). Psychiatrists prescribe a greater proportion of mood stabilisers and antipsychotics (Pincus *et al.* 1998). However there is very little information

available on the particular medication choices made by psychiatrists with regard to these and other psychiatric drugs and how these have changed over time.

We set out to examine the prescribing of one community mental health service and how this changed over a 12-year period.

Methods

The Cluain Mhuire Community Mental Health Service is a publicly funded adult mental health service in South County Dublin serving a catchment population of 195 000 people in 2016, which had increased by ~10% since 2006 (Central Statistics Office, 2017). The full range of secondary mental health care, including inpatient care, is provided by the service to adults up to age 65 as well as graduates (those over 65 with a history of attending the service in the 10 years before they turned 65). At any one time, the service has about 1500 active cases, at least half of whom have severe enduring mental illnesses (Douglas & Feeney, 2016). The service has three community mental health teams, each of which includes two consultant psychiatrists, one senior registrar and two registrars. Out of six, five consultant psychiatrists remained in place throughout the study period. There is also a clinical nurse specialist who can prescribe certain antipsychotic

* Address for correspondence: L. Feeney, Royal College of Surgeons in Ireland, Cluain Mhuire Community Mental Health Service, Newtownpark Avenue, Blackrock, Dublin, Ireland.
(Email: larkin.feeney@sjog.ie)

medications. The service uses a comprehensive electronic patient record (EPR) for all clinical records: the Mental Health Information System (MHIS) (St John of God Hospitaller Ministries, 2014). In 2004 an electronic prescribing component was introduced as part of the EPR and since that time only electronic prescriptions have been used for community prescribing.

We used Business Intelligence software (Oracle, 2005) to provide us with the numbers of prescriptions written for each medication in each year from 2005 to 2016. The lists were examined by hand by the authors as there were often multiple spellings of both generics and brands that needed to be combined. Sodium valproate, valproic acid, Epilim and other versions were combined as 'valproate'. Where there was uncertainty, the decision to include or discard results was agreed between the authors. For example there were a small numbers of prescriptions written for "Zuc" which very likely meant Zuclopenthixol but the authors felt that these should be excluded as this was not sufficiently clear. Inpatient prescribing has remained paper based so was not included. We were unable to access individual patient information or details of the prescription written such as doses or the length of time the medication was prescribed for. Where medications could be prescribed in different forms, for example tablet and long-acting injection, figures were combined as they could not be reliably distinguished.

Data were analysed using SPSS version 21 (IBM Corp., 2013). We used simple statistics to describe the data. For the purposes of examining changes over time, we divided the data into two 6-year time periods; 2005–2010 and 2011–2016. As this was a complete data set and we were not seeking to make inferences about the prescribing of other services, we did not use additional statistical methods which would have assumed that this data was a sample from a larger set (Gibbs *et al.* 2015). Approval for the study was granted by the St John of God Ethics Committee.

Results

Antipsychotics

Prescriptions for all antipsychotic medications fell by 7% between 2005–2010 and 2011–2016. Olanzapine was the most commonly prescribed medication in every year studied but prescription numbers fell from 12 573 in 2005–2010 to 9466 in 2011–2016 (–25%). Numbers of quetiapine, clozapine, paliperidone and aripiprazole prescriptions increased, while those for risperidone, sulpiride, amisulpride and ziprasidone fell. Overall, atypical antipsychotic prescriptions fell from 26 083 for 2005–2010 to 25 371 for 2011–2016 (–3%), mostly accounted for by olanzapine. Table 1 demonstrates these results.

Haloperidol was the most commonly prescribed typical antipsychotic. Overall the number of prescriptions for typical antipsychotics fell by 29% between 2005–2010 and 2011–2016, while those for haloperidol increased by 18% and those for chlorpromazine fell by 75%. Table 2 displays these results.

Mood stabilisers

Between 2005–2010 and 2011–2016 prescriptions for mood stabilisers fell from 12 704 to 9551 (–25%). Prescription numbers for individual mood stabilisers changed as follows: lithium (–32%), valproate (–18%), lamotrigine (–2%) and carbamazepine (–59%). Table 3 displays these results.

Antidepressants

Total prescriptions for all antidepressant medications declined between 2006–2010 and 2011–2016, from 23 001 to 17 355 (–25%). The most marked reductions were for tricyclic antidepressants (–40%) and monoamine oxidase inhibitors (–53%) but decreases were also seen for selective serotonin reuptake inhibitors

Table 1. Numbers of prescriptions for atypical antipsychotics by year

	Olanzapine	Quetiapine	Risperidone	Paliperidone	Aripiprazole	Amisulpride	Sulpiride	Clozapine
2005	1778	307	444	0	169	291	169	316
2006	1924	381	521	0	182	283	182	471
2007	2008	470	608	0	131	333	131	490
2008	2160	390	586	9	171	326	171	660
2009	2423	496	672	38	286	349	286	733
2010	2280	828	608	33	197	382	197	654
2011	1868	752	586	19	191	324	191	782
2012	1783	680	540	89	238	272	238	900
2013	1663	681	546	78	195	211	195	827
2014	1512	774	476	135	171	273	171	773
2015	1262	799	436	140	220	156	220	611
2016	1378	841	369	217	240	147	74	651

Table 2. Numbers of prescriptions for selected typical antipsychotics by year

	Haloperidol	Chlorpromazine	Trifluoperazine	Flupenthixol	Zuclopenthixol
2005	113	296	138	138	176
2006	128	310	131	131	173
2007	113	240	124	124	168
2008	178	212	113	113	203
2009	170	151	73	73	155
2010	259	114	56	56	157
2011	190	74	62	62	145
2012	178	60	67	67	114
2013	152	54	92	92	105
2014	186	56	92	92	163
2015	238	40	56	56	150
2016	230	45	47	47	135

Table 3. Numbers of prescriptions for mood stabilisers by year

	Lithium	Valproate	Lamotrigine	Carbamazepine
2005	778	578	256	187
2006	861	567	309	200
2007	908	665	356	206
2008	981	613	381	179
2009	1035	807	452	162
2010	902	690	475	156
2011	678	666	478	105
2012	679	646	442	61
2013	582	574	375	73
2014	632	479	325	78
2015	592	437	276	68
2016	535	424	288	58

(–32%) and venlafaxine (–20%). At the same time mirtazapine prescriptions increased slightly (+5%). Table 4 displays details on selected antidepressants.

Sedatives

Prescriptions for benzodiazepines fell from 9371 in 2006–2010 to 4913 in 2011–2016 (–48%). Over the same period prescriptions for Z-hypnotics declined from 7976 to 4632 (–42%). Individual examples included: zopiclone –44%; zolpidem –35%; diazepam –45%; and flurazepam –54%. At the same time, clonazepam showed an increase (+35%). Table 5 displays details on selected examples.

Others

The number of prescriptions written for certain medications increased dramatically in percentage terms but modestly in absolute terms. Pregabalin

prescriptions increased from 97 in 2006–2010 to 780 in 2011–2016 (+804%). Methylphenidate prescriptions increased from 29 in 2006–2010 to 225 in 2011–2016 (+775%). For some other medications, prescription numbers declined. Disulfiram prescriptions fell from 550 in 2006–2010 to 147 in 2011–2016 (–73%). Even more dramatic percentage declines were seen for acamprosate: down from 111 in 2006–2010 to 11 in 2011–2016 (–90%) and naltrexone: down from 151 in 2006–2010 to 0 in 2011–16 (–100%). Absolute numbers of prescriptions of dementia medications remained low throughout, for example Donepezil 36 in 2005–2010 and 55 in 2011–2016.

Discussion

This study demonstrates changes in prescribing patterns of psychiatric medications in one Irish community mental health service. The study has some serious limitations. The only data that we were able to obtain was for numbers of prescriptions. We could not access information on the duration of the prescriptions and they could have been for periods ranging from 1 day to 6 months; however, based on a review of current prescriptions, the vast majority would have been for between 1 and 6 months. Nor do we have any information on doses or the particular demographics of the population being prescribed for over the time period. However, we do know from the service's EPR Dashboard (St John of God Hospitaller Ministries, 2017) that at the present time there are ~1500 patients attending, 51% of whom are female and who have an average age of 44. We also know there were 996 new referrals to the service in 2013 and that referral numbers have increased steadily over time. Annual numbers of referrals for psychotic disorders were relatively stable

Table 4. Numbers of prescriptions for selected antidepressants by year

	Citalopram	Escitalopram	Sertraline	Fluoxetine	Paroxetine	Venlafaxine	Mirtazapine	TCADs	MAOIs
2005	643	510	191	191	338	768	195	571	59
2006	760	501	203	203	281	879	379	434	45
2007	788	488	254	219	276	874	497	452	42
2008	602	646	235	274	232	932	386	382	36
2009	565	783	281	313	163	907	421	378	47
2010	502	918	241	240	168	908	433	379	37
2011	442	645	243	208	132	739	413	355	35
2012	342	475	363	217	150	708	427	287	40
2013	299	468	353	231	114	642	414	264	17
2014	247	437	299	270	91	773	380	207	17
2015	243	319	295	203	75	688	390	210	8
2016	185	297	335	278	73	684	404	204	8

MAOIs, monoamine oxidase inhibitors; TCADs, tricyclic antidepressants.

Table 5. Numbers of prescriptions for Z-hypnotics and benzodiazepines by year

	Zopiclone	Zolpidem	Diazepam	Alprazolam	Clonazepam	Prazepam	Flurazepam
2005	982	389	318	133	79	345	396
2006	1106	368	511	173	60	239	362
2007	1078	349	428	155	64	207	370
2008	895	335	431	184	62	134	340
2009	879	329	538	145	59	136	423
2010	1015	245	472	172	38	67	353
2011	694	252	309	129	41	60	224
2012	622	272	291	116	37	37	207
2013	521	258	228	129	48	12	185
2014	530	209	237	56	56	27	149
2015	509	143	182	48	161	22	135
2016	441	175	232	76	145	16	132

during the study period while those for emotional crises with suicidal ideation increased dramatically (Douglas & Feeney, 2016). Despite the limitations, we think the results will be of general interest, will facilitate comparisons within other services and will allow for useful speculation on the reasons for the changes observed.

The numbers of prescriptions written for most medications declined over the study period. This fact is interesting of itself in that mental health services have been widely accused of inappropriately medicalising distress (Appiginesi, 2011; Whitaker, 2011; O'Brien, 2012). Interestingly the decline in prescription numbers occurred over the same period that the catchment population increased by 10% and referrals to the service increased by 50%. Most of these additional referrals involved emotional crises and talk therapy was sought in a much higher proportion than hitherto (Douglas & Feeney, 2016). There was a small increase in

the number psychologists employed by the service over the study period. It is reasonable to surmise from the data here that medical approaches to alleviating distress were not employed by the service in most of these cases.

One factor in the declining prescription numbers might be that up to 2011, patients of Dublin community mental health services received psychiatric medications free of charge if they were prescribed by their psychiatrist. In November 2011 this practice was stopped, eliminating any financial advantage to patients in receiving their prescriptions from a psychiatrist (My Irish Health, 2011). Also all patients with medical cards had to go to their GP from then on to have their prescription transcribed onto a GMS prescription. Our figures suggest that, at least for non-psychotic mental illnesses, these changes have caused more patients to seek their prescriptions from general practitioners. The Government focus in mental health has

increasingly been on 'facilitating and supporting earlier interventions at community and local level' which could have had a knock on effect of reduced prescribing of psychiatric medications at all levels (thejournal.ie, 2017). A shift to less pharmaceutical industry promotion may also be having an impact (Appelbaum & Gold, 2010).

Concern about the side effect profiles of particular medications may have impacted on prescription numbers. Olanzapine has been strongly associated with metabolic side effects and this may have accounted for the major decline in its prescription numbers (Meyer & Stahl, 2009). This fall off appears to have been compensated for by increases in quetiapine, aripiprazole, paliperidone and clozapine prescription numbers. In line with international trends and guidelines, atypical antipsychotics were increasingly favoured over typical (Monshat *et al.* 2010; Verdoux *et al.* 2010). The numbers for certain atypical antipsychotics was likely bolstered by their increased use in bipolar disorder, depression and off-label for anxiety (Alexander *et al.* 2011; Hayes *et al.* 2011). The increased prescription numbers for clozapine is encouraging in that studies indicate it remains under used in treatment resistant psychosis (Warnez & Alessi-Severini, 2014). The prescription numbers for most typical antipsychotics fell considerably over the study period; only haloperidol bucked this trend. Cost may have been a factor here in that haloperidol has been found to be more cost-effective than atypical antipsychotics (Davies *et al.* 2007). Awareness of legal actions taken against drug companies making atypical antipsychotics could also be relevant to the fall off in the prescribing of certain medications (Field, 2010).

The decline in prescriptions for certain mood stabilisers echoes findings of some other studies and may be accounted for by trends towards increased use of lamotrigine and atypical antipsychotics in bipolar disorder (Walpoth-Niederwanger *et al.* 2012; Chang *et al.* 2016). Side effect concerns may also have played a role in the declining prescription numbers for certain antidepressants. For example, papers highlighting the potential for citalopram and escitalopram to cause cardiac arrhythmias at high doses may have contributed to the decline in their prescription numbers and the rise in sertraline's (Funk & Bostwick, 2013). The marked decline in tricyclic and monoamine oxidase inhibitor prescription numbers is in keeping with the literature (Mars *et al.* 2017).

The decline in the number of prescriptions for Z-hypnotics and benzodiazepines likely reflects increased awareness of the potential for addiction and abuse with these medications (College of Psychiatrists of Ireland, 2012; Kapil *et al.* 2014). However, the increased prescription numbers for mirtazapine and

pregabalin suggest that psychiatrists are looking to alternative classes of medications for sedative and anxiolytic effects, some of which may also have abuse potential; particularly pregabalin (Evoy *et al.* 2017).

The rise in prescription numbers for attention deficit hyperactivity disorder (ADHD) medications such as methylphenidate is perhaps surprising only in its modesty, given the increase in onwards referral of young adults already established on stimulant medications by Child and Adolescent Mental Health Services for treatment of ADHD, as well as the increase in new diagnoses of ADHD among adults (Castle *et al.* 2007; Centre for Disease Control and Prevention, 2016; Hughes *et al.* 2017). This could reflect a need for training for general adult psychiatrists in ADHD management (National Institute for Health and Care Excellence, 2016). The number of prescriptions of medications for dementia was surprisingly low given the reported rising prevalence of diagnoses, but perhaps indicates that the vast majority of these medications are prescribed by GPs, old age physicians and old age psychiatrists (Kearney *et al.* 2011; Pierce *et al.* 2014).

Up to 2008, the Cluain Mhuire Service had included an alcohol addiction assessment clinic but after the publication of the national mental health strategy, Vision for Change (Expert Group on Mental Health Policy, 2006) and the national addiction strategy (Department of Community, Rural and Gaeltacht Affairs, 2009), which envisaged a separation of mental health and addiction services, the Cluain Mhuire Service decided to wind down its alcohol clinic. This likely led to the observed fall off in prescription numbers for disulfiram, acamprosate and naltrexone. This separation has not been without controversy and service provision for alcohol addiction remains patchy and inequitable around the country (National Mental Health Conference, 2013).

In conclusion, this study has demonstrated that prescription numbers between 2005 and 2016 in one Irish community mental health service for some antipsychotic medications, for example olanzapine and most typical antipsychotics, declined, whereas those for others, for example quetiapine, aripiprazole, clozapine and haloperidol, increased. The service wrote fewer prescriptions for antidepressants, mood stabilisers and sedative medications from 2011 to 2016 than it did from 2005 to 2010. This is counter to most trends described nationally and internationally and may reflect an increased proportion of prescriptions being written by GPs and/or reduced reliance on medication to treat emotional distress. Due to the lack of demographic and other information on the patients being prescribed for, these trends cannot be generalised to other community mental health services; nonetheless it is interesting to speculate on the reasons for the changes observed.

Financial Support

This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

Conflicts of Interest

The authors declare that there no conflicts of interest.

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committee on human experimentation with the Helsinki Declaration of 12 1975, as revised in 2008. The authors assert that ethical approval for publication of this research has been provided by their local Ethics Committee.

References

- Alexander GC, Gallagher SA, Mascola A, Moloney RM, Stafford RS (2011). Increasing off-label use of antipsychotic medications in the United States, 1995–2008. *Pharmacoepidemiology and Drug Safety* **20**, 177–184.
- Appignanesi L (2011). The mental illness industry is medicalising normality. *The Guardian*, 06 September 2011 (<https://www.theguardian.com/commentisfree/2011/sep/06/mental-illness-medicalising-normality>). Accessed 13 September 2017.
- Appelbaum PS, Gold A (2010). Psychiatrists' relationships with industry: the principal-agent problem. *Harvard Review of Psychiatry* **18**, 255–265.
- Castle L, Aubert RE, Verbrugge RR, Khalid M, Epstein RS (2007). Trends in medication treatment for ADHD. *Journal of Attention Disorders* **10**, 335–342.
- Centre for Disease Control and Prevention (2016). Attention-deficit hyperactivity disorder (ADHD): data and statistics (<https://www.cdc.gov/ncbddd/adhd/data.html>). Accessed 13 September 2017.
- Central Statistics Office (2017). Census 2016 Summary Results. Central Statistics Office, April 2017 (<http://www.cso.ie/en/media/csoie/newsevents/documents/census2016summaryresultspart1/Census2016SummaryPart1.pdf>). Accessed 13 September 2017.
- Chang CM, Wu CS, Huang YW, Chau YL, Tsai HJ (2016). Utilization of psychopharmacological treatment among patients with newly diagnosed bipolar disorder from 2001 to 2010. *Journal of Clinical Psychopharmacology* **36**, 32–44.
- College of Psychiatrists of Ireland (2012). A consensus statement on the use of benzodiazepines in specialist mental health services: EAP position paper (http://www.drugsandalcohol.ie/23872/1/CPsychI_position_paper_on_benzodiazepines_June_2012.sflb.pdf). Accessed 13 September 2017.
- Cowen P, Harrison P, Burns T (2012). *Shorter Oxford Textbook of Psychiatry*. Oxford University Press: Oxford.
- Davies L, Lewis S, Jones P, Lloyd HM (2007). Cost-effectiveness of first- v. second-generation antipsychotic drugs: results from a randomised controlled trial in schizophrenia responding poorly to previous therapy. *British Journal of Psychiatry* **191**, 14–22.
- Department of Community, Rural and Gaeltacht Affairs (2009). National Drugs Strategy 2009–2016 (http://health.gov.ie/wp-content/uploads/2014/03/nds_2009-16.pdf). Accessed 13 September 2017.
- Douglas L, Feeney L (2016). Thirty years of referrals to a community mental health service. *Irish Journal of Psychological Medicine* **33**, 105–110.
- Evoy KE, Morrison MD, Saklad SR (2017). Abuse and misuse of pregabalin and gabapentin. *Drugs* **77**, 403–426.
- Expert Group on Mental Health Policy (2006). *A Vision for Change: Report of the Expert Group on Mental Health Policy*. The Stationary Office: Dublin.
- Field RI (2010). Antipsychotic medications are spelling legal trouble for drugmakers. *Healthcare and Law* **35**, 621–622.
- Funk KA, Bostwick JR (2013). A comparison of the risk of QT prolongation among SSRIs. *Annals of Pharmacotherapy* **47**, 1330–1341.
- Gibbs BG, Shafer K, Dufur MJ (2015). Why infer? The use and misuse of population data in sport research. *International Review for the Sociology of Sport* **50**, 115–121.
- Hamann J, Langer B, Leucht S, Busch R, Kissling W (2004). Medical decision making in antipsychotic drug choice for schizophrenia. *Am J Psychiatry* **161**, 1301–1304.
- Hayes J, Prah P, Nazareth I, King M, Walters K, Petersen I, Osborn D (2011). Prescribing trends in bipolar disorder: cohort study in the United Kingdom THIN primary care database 1995–2009. *PLoS One* **6**, e28725.
- Hughes GC, Hanrahan SO, Kavanagh G, McNicholas F (2017). Review of international clinical guidelines for adolescents on transition to Adult Mental Health Services and adults with attention-deficit hyperactivity disorder and their application to an Irish context. *Irish Journal of Psychological Medicine* **34**, 59–73.
- IBM Corp. (2013). IBM SPSS Statistics for Windows, Version 21.0. IBM Corp: Armonk, NY.
- Ilyas S, Moncrieff J (2012). Trends in prescriptions and costs of drugs for mental disorders in England, 1998–2010. *British Journal of Psychiatry* **200**, 393–398.
- Jureidini JN, McHenry LB (2009). Key opinion leaders and paediatric antidepressant overprescribing. *Psychotherapy and Psychosomatics* **78**, 197–201.
- Kapil V, Green JL, Le Lait C, Wood DM, Dargan PI (2014). Misuse of benzodiazepines and Z-drugs in the UK. *British Journal of Psychiatry* **205**, 407–408.
- Kaye J, Bradbury B, Jick H (2003). Changes in antipsychotic drug prescribing by general practitioners in the United Kingdom from 1991 to 2000: a population-based observational study. *British Journal of Clinical Pharmacology* **56**, 569–575.
- Kearney PM, Cronin H, O'Regan C, Kamiya Y, Savva GM, Whelan B, Kenny R (2011). Cohort profile: the Irish longitudinal study on ageing. *International Journal of Epidemiology* **40**, 877–884.
- Mars B, Heron J, Kessler D, Davies NM, Martin RM, Thomas KH, Gunnell D (2017). Influences on antidepressant prescribing trends in the UK: 1995–2011. *Social Psychiatry and Psychiatric Epidemiology* **52**, 193–200.

- Meyer JM, Stahl SM** (2009). The metabolic syndrome and schizophrenia. *Acta Psychiatrica Scandinavica* **119**, 4–14.
- Monshat K, Carty B, Olver J, Castle D, Bosanac P** (2010). Trends in antipsychotic prescribing practices in an urban community mental health clinic. *Australasian Psychiatry* **18**, 238–241.
- My Irish Health** (2011). HSE to end free psychiatric medication in greater Dublin area (<http://www.myirishhealth.com/news/hse-to-end-free-psychiatric-medication-in-greater-dublin-area>). Accessed 14 September 2017.
- NACD, PHIRB** (2012). Drug use in Ireland and Northern Ireland. 2010/11 Drug Prevalence Survey: Sedatives or Tranquillisers and Anti-depressants Results. Bulletin 6. NACD and PHIRB: Dublin (<http://www.drugsandalcohol.ie/18660/1/bulletin6.pdf>). Accessed 13 September 2017.
- National Institute for Health and Care Excellence (NICE)** (2016). Treatment of adults with ADHD. (<https://www.nice.org.uk/guidance/CG72>). Accessed 13 September 2017.
- National Mental Health Conference** (2013). The case for change in addiction and mental health services: addiction and mental illness, two problems, one person (<http://www.dualdiagnosis.ie/wp-content/uploads/2011/05/national-mental-health-conference-nov-13-published.pdf>). Accessed 13 September 2017.
- O'Brien C** (2012). Bitter pills to swallow. *Irish Times*, 14 April 2012 (<http://www.irishtimes.com/news/bitter-pills-to-swallow-1.501458>). Accessed 13 September 2017.
- Oracle** (2005). Business Intelligence. OracleBI Discoverer Viewer Version 10.1.2.45.46c (<https://www.oracle.com/solutions/business-analytics/business-intelligence/index.html>). Accessed 13 September 2017.
- Pierce M, Cahill S, O'Shea E** (2014). Prevalence and projections of dementia in Ireland, 2011–2046. Genio (www.genio.ie/system/files/publications/Dementia_Prevalence_2011_2046.pdf). Accessed 13 September 2017.
- Pincus HA, Tanielian TL, Marcus SC, Olfson M, Zarín DA, Thompson J, Zito JM** (1998). Prescribing trends in psychotropic medication; primary care, psychiatry and other medical specialties. *JAMA* **279**, 526–531.
- Rosholm JU, Gram LF, Isacsson G, Hallas J, Bergman U** (1997). Changes in the pattern of antidepressant use upon the introduction of the new antidepressants: a prescription database study. *European Journal of Clinical Pharmacology* **52**, 205–209.
- St John of God Hospitaller Ministries** (2014). MHIS (<http://www.mhis.ie/profilesummary.htm>). Accessed 13 September 2017.
- St John of God Hospitaller Ministries** (2017). MHIS Dashboard, Version 13. (<http://www.mhis.ie/profilesummary.htm>). Accessed 02 April 2017.
- Thejournal.ie** (2017). 'This is not acceptable': nearly 2,000 new staff needed in mental health services. *Thejournal.ie*, 3 August 2017 (<http://www.thejournal.ie/mental-health-hse-3527719-Aug2017/>). Accessed 13 September 2017.
- Verdoux H, Tournier M, Begaud B** (2010). Antipsychotic prescribing trends: a review of pharmaco-epidemiological studies. *Acta Psychiatrica Scandinavica* **121**, 4–10.
- Walpoth-Niederwanger M, Kemmler G, Grunze H, Weiss U, Hörtnagl C, Strauss R, Blasko I, Hausmann A** (2012). Treatment patterns in inpatients with bipolar disorder at a psychiatric university hospital over a 9-year period: focus on mood stabilizers. *International Clinical Psychopharmacology* **27**, 256–266.
- Warnez S, Alessi-Severini S** (2014). Clozapine: a review of clinical practice guidelines and prescribing trends. *BMC Psychiatry* **14**, 102.
- Whitaker R** (2011). *Anatomy of an Epidemic: Magic Bullets, Psychiatric Drugs, and the Astonishing Rise of Mental Illness in America*. Broadway Books: New York.