



Dementia—a major public health problem: the role of in-patient psychiatric facilities

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Abstract

This paper reviews data on admissions to Irish psychiatric units and hospitals for those suffering from organic mental disorders, in particular dementia, over the course of the last half century. Admission and census data from the National Psychiatric In-patient Reporting System (NPIRS) from 1963 to 2016 are examined and discussed in light of Ireland's ageing population. The NPIRS database was established in the 1960s to record admission and discharge activity in Irish psychiatric units and hospitals. Admission data from the database are presented in 5-yearly intervals from 1965 to 2015, while census data are presented for 1963 and 2016.

Keywords Dementia · Organic mental disorders · Psychiatric admissions · Psychiatric in-patients

Background

Dementia is one of the most devastating diseases of human kind both for affected individuals and their families. It is age related and with the spectacular increase in life expectation in developed countries over the last half century or more, it now constitutes a major public health problem. Estimates of its prevalence vary according to the age composition of elderly populations but in 2015, the WHO estimated that 47 million people were affected by dementia worldwide, approximately 5% of the world's elderly population [1]. In 2016, the Irish population was 4,761,865 with 637,567 (13%) aged 65 and over [2], a relatively small proportion in the general European context. One can therefore assume over 31,000 elderly are currently affected by dementia according to WHO estimates, a number set to increase substantially as the Irish population ages. The majority of those with dementia suffer from Alzheimer's dementia, a progressive condition for which currently there is no remedy. Therefore, the extent of the problem in familial, social and economic terms

becomes apparent. While age-specific incidence data for dementia are difficult to come by, it is worth citing from the Framingham study incidence figures of dementia over a 20-year period for the 65–69 age group, at 7 per 1000, rising to 118 per 1000, at age 85–89 [3]. Lifetime risks for dementia for men and women aged 65 to 100 were 32.8 and 45%, respectively, while that for Alzheimer's in men and women were 25.5 and 28.1%, respectively. Unfortunately, there are no incidence data available in Ireland. However, Pierce et al. [4] estimated the number of people with dementia in Ireland in 2011 to be 47,849, with an estimated 26,413 people with dementia aged 65 and over living in the community. They further projected that the number of people with dementia will double over the next 20 years to an estimated 94,000 in 2031 and to 152,157 in 2046, with the estimated number of people with dementia living in the community expected to rise to 60,000 in 2031.

The elderly in Irish nursing homes and public long stay beds

The National Dementia Strategy [5] reckoned that 34% of persons, including a small number of under 65s with dementia in Ireland are in residential care so by our calculations, a minimum of 12,618 of those with dementia are accommodated in in-patient care. But where are they? There are an estimated 602 nursing homes in Ireland. The majority of beds in these nursing homes (22,000) are provided by the private and voluntary nursing home sector according to Nursing Homes

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Table 1 The total elderly and those given an organic diagnosis in Irish psychiatric hospitals in 1963 by sex

	Numbers			Rates per 100,000 total population		
	65–74	75+	All (65+ in psychiatric hospital 1963)	65–74	75+	All
Males	1479	720	2199	1552.7	1331.8	1472.7
Females	1646	1085	2731	1629.3	1676.4	1647.7
Total	3125	1805	4930	1592.1	1519.6	1564.8
Organic Psychoses						
Males	276	290	566	289.8	536.4	379.1
Females	434	520	954	429.6	803.4	575.6
Total	710	810	1520	361.7	681.9	482.4

Numbers with rates per 100,000 population

Source: NPIRS In-patient Census Data 1963

Diagnoses reported relate to ICD 7 codes recorded at the time of the census. Further information on diagnostic classifications is available in the census report for 1963 [8]

Ireland [6] and they account for over 80% of the country's long-term care beds, with the remainder being supplied by the public sector. The 2017 HSE National Service Plan [7] states that, at the end of 2016, there were 5150 National Nursing Homes Support Scheme beds in public long stay units. Therefore, we calculate a total of 27,150 long stay elderly beds. In neither case do we know the proportion of these patients suffering from dementia.

The elderly in Irish psychiatric hospitals from 1963 to 2016

Residents

Eleven percent of all patients in psychiatric hospitals on census night of 1963 were aged 65 years and over [8]. They comprised two different groupings. The first were those with

non-organic diseases, mostly schizophrenia, admitted earlier and having grown old in the hospital. The second comprised those with organic disorders and likely to have been admitted more recently.

Table 1 shows the composition of the elderly in Irish psychiatric hospitals as enumerated by the psychiatric hospital census of 1963. There were 4930 elderly patients resident in Irish psychiatric hospitals in the 1963 census, comprising 25% of all in-patients. Of these elderly patients, almost 31% (1520) had a diagnosis of organic psychoses, comprising almost 8% of all in-patients on census night. The census did not distinguish between different organic diagnoses but it may reasonably be presumed that the majority were affected by Dementia in Alzheimer's disease.

By the time of the 2016 in-patient psychiatric census, numbers of patients resident had fallen from 19,801 in 1963 to 2408 [7], with those aged 65 and over falling from 4930 to 866 (Table 2), with the hospitalisation rate for patients

Table 2 The total elderly and those given an organic diagnosis in Irish psychiatric hospitals in 2016 by sex

	Numbers			Rates per 100,000 total population		
	65–74	75+	All elderly (in psychiatric hospitals in 2016)	65–74	75+	All
Males	227	188	415	151.6	201.0	18.3
Females	229	222	451	147.7	162.0	19.5
Total	456	410	866	20.1	17.7	18.9
Organic Psychoses						
Males	65	82	147	43.4	87.7	6.5
Females	27	68	95	17.4	49.6	4.1
Total	92	150	242	30.2	65.1	5.3

Numbers with rates per 100,000 population

Source: NPIRS In-patient Census Data 2016

Diagnoses reported relate to ICD 10 codes recorded at the time of admission. Further information relating to classification of diagnoses is available in the census report for 2016 [9]

Table 3 Breakdown of organic mental disorders Irish Psychiatric Units and Hospitals Census 2016

Primary admission diagnosis census 2016 65 years and over	N	%
F00 dementia in Alzheimer’s disease	128	52.89
F01 vascular dementia	40	16.53
F02 dementia in other diseases classified elsewhere	18	7.44
F03 unspecified dementia	37	15.29
F06 other mental disorders due to brain damage and dysfunction and to physical disease	10	4.13
F04 organic amnesic syndrome not induced by alcohol and other psychoactive substances;	9	3.72
F05 delirium not induced by alcohol and other psychoactive substances; F07 personality and behavioural disorders due to brain disease, damage and dysfunction;		
F09 unspecified organic or symptomatic mental disorder		
Total F00–F09	242	100.00

Source: NPIRS In-patient Census Data 2016

Note: Diagnoses reported relate to ICD 10 codes recorded at the time of admission. Further information relating to classification of diagnoses is available in the census report for 2016 [9]

aged 65–74 at 149.6 per 100,000 and 177.8 per 100,000 for the 75 and over age group. Twelve per cent of all patients in 2016 were given a diagnosis of organic mental disorder.

Of the 866 elderly, 242 (28%) (see Table 3) were given a diagnosis of organic disorder, 92 of these were aged 65 to 74 (rate of 30.2 per 100,000) and 150 were aged 75 years and over (rate of 65.1 per 100,000). Of the 242 with organic disorder, 128 (53%) were given a diagnosis of dementia in Alzheimer’s disease (F00), 40 (16%) were given a diagnosis of vascular dementia (F01), 18 (7%) were given a diagnosis of dementia in other diseases classified elsewhere (F02), 37 (15%) unspecified dementia (F03), 10 (4%) had a diagnosis of other mental disorders due to brain damage and dysfunction and to physical disease (F06), with the remaining nine having a diagnosis of one or other of the following: F04, F07 or F09.

The remaining elderly, the majority (624, 26% of all patients on census night), suffered from non-organic disorders such as schizophrenia and just over 50% of these (315) had been in hospital for 1 year or more with some of these having been admitted in earlier life and not been discharged (137, 22% of all elderly non organic had been in hospital for 10 years or more on census night).

Of the total number of elderly (866) in psychiatric units and hospitals on census night, 596 (69%) were

accommodated in public sector beds and 31% were in the independent/private sector.

Admissions

Over the 51-year period from 1965 to 2016, there were 184,424 admissions to Irish psychiatric units and hospitals of persons aged 65 years and over, accounting for 15% of the total number of admissions for all persons over this same period (1,234,591). This yielded an average of 3547 elderly admissions per year, with an average of 2006 female admissions and 1540 male admissions per year. Elderly admissions peaked in 1986 (Fig. 1), at 4991 admissions, accounting for 17% of all in-patient admissions in that year and 1% of all elderly people in Ireland. For the period from 1978 to 1995, elderly admissions were in excess of 4000 admissions per year, with rates for these years in excess of 1000 per 100,000 population. Admission rates were highest in 1985, at 1323.5 per 100,000 while rates in 2015 were a more modest 504.9 per 100,000. Admissions for elderly patients in 2016 had declined to less than 1% of all elderly people in Ireland.

Fifty-seven per cent of all 184,424 elderly in-patient admissions were female. Females accounted for a higher proportion

Fig. 1 Elderly admissions 1965–2016. Numbers

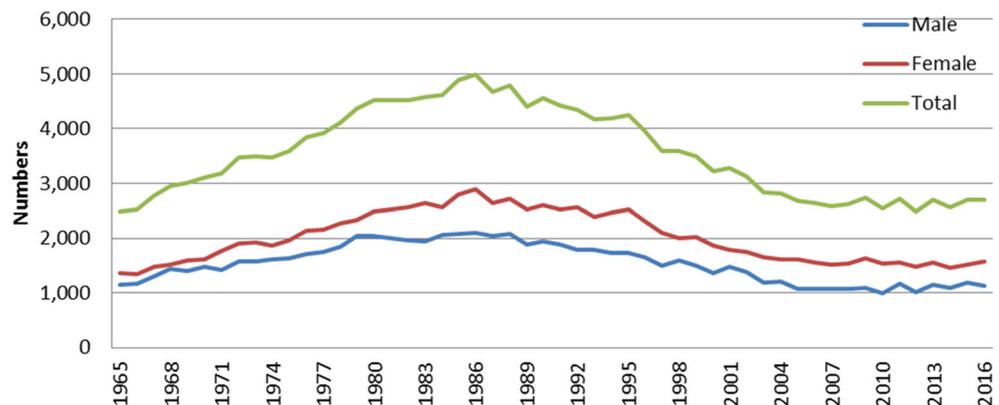


Table 4 Elderly admissions by age and diagnosis in 1965

	Numbers				Rates		
	65–69	70–79	80+	All elderly	65–69	70–79	80+
Males	492	531	116	1139	894	748	485
Females	539	671	143	1353	911	819	447
All diagnoses, both sexes	1031	1202	259	2492			
Organic psychoses, both sexes	187	615	222	1024	164	402	397

1965. Numbers with rates per 100,000 population

Source: NPIRS Admissions Data 1965

of all elderly admissions than males for all years, accounting for up to 60% of all elderly admissions in the early 2000s.

Looking at the earliest year for which data are available, Table 4 shows us that in 1965 organic admissions of 65s and over comprised 41% of all elderly admissions (1024/2492). The age-specific admission rates per 100,000 population for all elderly and organic admissions are set out in this table.

Table 5 sets out admission numbers and rates per 100,000 population for 65s and over from 1965 onwards in five-year intervals along with the proportion of all admissions of all ages that they constituted.

Table 6 gives a diagnostic breakdown, again in five year intervals, for admissions aged 65 and over in numbers and rates. It should be pointed that up to 1980 the category manic depressive psychosis was employed but thereafter mania became a separate diagnostic entity. While rates have declined for all diagnoses, it is noticeable how the proportion of organic admissions as a percentage of all elderly admissions declined over this period from 41% in 1965 to 17% in 2015 as admission numbers fell.

Table 7 presents age group of admissions for six years combined 2010–2016. Numbers decline with age, this being true for all diagnoses including the organic component and a female excess is increasingly evident with age. Just over one-third (34%) were aged 65–69 years, 27% were aged 70–74 years, 19% were aged 75–79 years, 12% were aged 80–84 years, 6% were aged 85–89 and just over 1% were aged 90 years and over.

Table 8 provides information on primary diagnoses for the main diagnostic groups by age group for 16,746 (91%) of the 18,419 elderly admissions from 2010 to 2016. (The remaining 9% (1673) comprised various other diagnostic categories such as other and unspecified mental disorder, personality disorders, eating disorders and other drug disorders).

Of the 2944 elderly organic admissions 1458 (49.5%) were given a diagnosis of dementia in Alzheimer's disease (ICD F00), 506 (17.2%) were diagnosed as suffering from vascular dementia (F01), 192 (6.5%) as dementia in other diseases specified elsewhere (F02), 387 (13.1%) as unspecified dementia (F03), 177 (6.0%) as delirium not induced by alcohol and other psychoactive substances (F05) and 149 (5.1%) from

Table 5 Admission numbers and rates per 100,000 for 65 years and over from 1965 to 2015 as proportions of all admissions

Year	Admission Numbers			% of admissions	Rates		
	Males	Females	Total		Males	Females	Total
1965	1139	1353	2492	16.1	763	816	791
1970	1471	1622	3099	15.2	981	937	959
1975	1632	1957	3589	13.9	1083	1092	1088
1980	2036	2484	4520	16.7	1249	1252	1251
1985	2078	2805	4883	16.8	1258	1376	1323
1990	1948	2608	4556	16.4	1154	1209	1185
1995	1738	2620	4258	16.1	1004	1100	1057
2000	1354	1874	3228	13.3	764	792	780
2005	1064	1617	2681	12.6	562	655	648
2010	1022	1541	2543	12.7	484	591	543
2015	1178	1517	2695	15.1	484	519	503

Source: NPIRS Admissions Data 1965–2015

Table 6 Admissions of 65s and over by diagnosis from 1965 to 2015

	Numbers					%	Rates				
	Mania	Schiz	Mdp/Dep	Alc	Org		Mania	Schiz	Mdp/Dep	Alc	Org
1965		130	655	152	1024	41.1		41.3	207.9	48.2	325
1970		196	735	218	1161	37.5		60.7	227.5	67.5	359.4
1975		338	1180	362	840	23.4		102.5	357.8	109.8	254.7
1980		406	1400	528	953	21.1		112.3	387.4	146.1	263.7
1985	515	508	2419	581	918	18.8	139.6	137.7	655.6	157.5	248.8
1990	415	646	2391	551	630	13.8	108	168.1	622.1	143.4	163.9
1995	408	614	2228	459	576	13.5	101.3	152.4	553	113.9	143
2000	268	478	1694	292	527	16.3	64.8	115.5	409.3	70.6	127.3
2005	327	369	1378	212	398	14.9	75	84.6	316.1	48.6	91.3
2010	274	371	1234	112	416	16.4	58.6	79.3	263.7	23.9	88.9
2015	296	412	1281	116	456	16.9	55.3	77	239.3	21.7	85.2

Source: NPIRS Admissions Data 1965–2016

Schiz = Schizophrenia; Mdp = Manic Depressive Psychosis; Dep = Depression; Alc = Alcoholism The category Manic Depressive Psychoses includes Mania and Depressive Disorders from 1985 onwards to allow comparability with earlier years (1965–1980)

Note: % Org indicates organic admissions as a percentage of all elderly admissions in that year

Diagnoses reported each year relate to the version of ICD in existence at the time of each report ranging from Version 7 to 10. Information on the classification of diagnosis is available in the annual reports for each year

other mental disorders due to brain damage and dysfunction (F06), these comprising 97.4% of admissions given an organic diagnosis.

Discussion and conclusion

The data presented here indicate the part played by psychiatric units and hospitals in the reception and care of those aged 65 and over suffering from organic mental disorders, predominantly dementia, over half a century in Ireland. Alzheimer’s

disease accounts for half of the admission dementia population and vascular dementia for just under a fifth. The resident elderly organic population has also declined significantly with dementia in Alzheimer’s accounting for just over half of organic elderly diagnoses in 2015.

With the operation of the 2001 Mental Health Act a patient with dementia can only be admitted compulsorily to an approved psychiatric centre if the dementia is severe and accompanied by severe psychiatric or behavioural symptoms. However the decline in admission numbers for organic disorders had begun to fall before the introduction of the 2001 Mental Health Act and its commencement in its entirety in November 2006.

These clients have progressively diminished with passing years although still comprise a substantial proportion of psychiatric in-patient care. With up to 242 persons with organic disorders in units and hospitals on census night in 2016, the majority of these having a diagnosis of Alzheimer’s Disease, and with over 2500 admissions annually for elderly patients, 17% of whom had an organic diagnosis in 2016, it is clear that psychiatric units and hospitals continue to provide a vital role in caring for patients with dementia.

It is assumed that the decline in the psychiatric services has been accounted for by increased nursing home care particularly in the private sector. O’Neill and O’Keefe in 2003 [10] recorded that 19,568 long stay beds are provided for the elderly (9573 or 49%) in the public sector provided by health boards (now the HSE), with the remaining 9995 coming from private and voluntary sources. A more recent report indicated

Table 7 Elderly admissions 2010 to 2016 combined by age group and sex

	Numbers			Percentages		
	Male	Female	Total	Male	Female	Total (Col %)
65–69	2836	3493	6329	44.8	55.2	34.4
70–74	2177	2851	5028	34.4	45.0	27.3
75–79	1388	2078	3466	40.0	60.0	18.8
80–84	901	1345	2246	40.1	59.9	12.2
85–89	350	718	1068	32.8	67.2	5.8
90–94	63	177	240	26.3	73.8	1.3
95 and over	11	31	42	26.2	73.8	0.2
Total	7726	10,693	18,419	41.9	58.1	100.0

Numbers and percentages

Source: NPIRS Admissions Data 2010–2016

Table 8 Primary admission diagnosis elderly admissions 2010–2016. Selected diagnoses by age group. Numbers

	Organic Mental Disorders	Alcoholic Disorders	Schizophrenia	Depressive Disorders	Mania	Neuroses
65–69	456	407	1128	2344	885	490
70–74	654	242	782	1961	571	392
75–79	671	139	448	1350	308	237
80–84	639	48	209	863	141	126
85–89	380	2	83	408	49	67
90–94	113	1	36	56	12	11
95 & over	31	0	1	4	0	1
Total	2944	839	2687	6986	1966	1324

Source: NPIRS Admissions Data 2010–2016

Note: Diagnoses reported each year relate to ICD 10. Further information on the classification of diagnosis is available in the annual reports for each year

that two-thirds (393) of nursing homes in Ireland are privately operated, approximately one-fifth are HSE-funded and 13% are voluntary or not for profit [11]. Cahill et al. [11] reported that 54 nursing homes operate Specialist Care Units (SCUs) for patients with dementia, accommodating 1034 patients with dementia, representing 7% of all dementia patients living in long-stay residential care. Cahill et al. found that the bulk of this specialised residential care for dementia was provided for by the private sector. Additionally, admissions into the public sector are likely to have been delayed by the initiation and increase in specialised psychiatric community services for later life psychiatry. There is, however, very little data in the private sector to determine the numbers resident and admitted who suffer from dementia.

While no national dementia register or database currently exists, estimates suggest that up to 25% of patients in general hospitals at any one time may have dementia [12]. Timmons et al. [13] report that our acute hospitals in Ireland are not currently equipped to provide best dementia care due to poor staff training and knowledge around dementia amongst other things and concluded that dementia care in acute hospitals is substandard, increasing the likelihood of adverse patient outcomes and the cost of dementia care.

The WHO estimate that the number of people affected by dementia worldwide is likely to increase to 75 million in 2030 and 132 million by 2050 [1]. The increase in Ireland's elderly will, unless improved preventative and therapeutic measures evolve, almost certainly increase the prevalence of Alzheimer's disease despite a possible decline in incidence and an overestimate of projected prevalence. It is likely that the same lifestyle factors that have reduced incidence and mortality in cardiovascular disorders may already have impacted positively on the incidence and prevalence of vascular dementia. Nonetheless the public health and social and

economic consequences of dementia are immense, with costs estimated at €1.69 billion per annum in Ireland [12].

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

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