Chronic Obstructive Pulmonary Disease (COPD) including Bronchiectasis

04

Key Points

- COPD places a significant burden of disease on people and health services in Ireland as evidenced by mortality and hospitalisation rates
- The exact COPD prevalence in Ireland is unknown
- Ireland has a relatively high prevalence of hereditary alpha-1 antitrypsin deficiency which is a risk factor for COPD
- Bronchiectasis can be idiopathic but also occurs in those with cystic fibrosis (CF), primary ciliary dyskinesia, primary immunodeficiencies and is associated with systemic diseases, including inflammatory bowel disease and rheumatoid arthritis

Background

Chronic obstructive pulmonary disease (COPD) is a major burden to individuals, societies and healthcare services throughout the world. Its impact is expected to rise in the decades to come, due both to continued exposure to risk factors and to an ageing population. COPD is characterised by persistent airflow limitation that is usually progressive and associated with a chronic inflammatory response in the airways and lungs to noxious particles or gases. It is a syndrome of two main phenotypes - chronic bronchitis and emphysema. Most people with COPD have varying degrees of both.

The most important and modifiable risk factor for COPD is smoking. About 40–50% of lifelong smokers develop COPD. As not all smokers develop clinically significant COPD, genetic factors may modify individual risk. The proportion of the risk of COPD attributable to smoking is estimated to be 40–60%[1]. Never-smokers comprise one-quarter of those classified with stage II+ disease (Global Initiative for Chronic Obstructive Lung Disease (GOLD))[1]. Occupational exposure accounts for 15–20% of COPD cases. In never-smokers, the fraction of COPD attributable to occupational exposure is estimated to be 30%[1].

Adverse respiratory events in childhood influence the risk of COPD as adults. Early life environmental factors including maternal smoking, frequent respiratory infections and asthma in childhood and bronchial hyper-reactivity are also risk factors for COPD in adulthood. Passive exposure to cigarette smoke contributes to impaired lung function in children. The proportion of the risk of COPD attributable to these early childhood events may be as great as that attributable to smoking[1].

In addition to childhood factors, the risk of developing COPD is inversely related to socio-economic status based on education or income.[2]

The role of outdoor air pollution in Europe as a cause of COPD is unclear. A high level of urban air pollution is harmful to individuals with COPD. The 'All Ireland study on air pollution and residential solid fuel' identified potential residential PM10 (a general term for organic air pollutants measuring less than 10 µm in diameter) hotspots in Ireland[3]. Indoor air pollution caused by the use of biomass fuel is a risk factor for the development of COPD.

The best documented genetic risk factor for COPD is hereditary alpha-1 antitrypsin deficiency. People born with this deficiency do not produce enough alpha-1 antitrypsin protein in their liver. This protein helps to protect the lungs from the harmful effects of infections and inhaled irritants, particularly tobacco smoke[4]. In Ireland, one in 25 Irish people carry the defective gene that causes alpha-1 antitrypsin deficiency. The most common mutation is the Z mutation but the S and other mutations also cause milder deficiency[5].

Bronchiectasis is a long-term condition where the airways of the lungs become abnormally widened, leading to a build-up of excess mucus that can make the lungs more vulnerable to infection and can co-exist with COPD. Bronchiectasis is associated with a range of both common and rare diseases, some of which impact on mucociliary clearance and immunity. When mucus clearance and local defence mechanisms against micro-organisms are impaired, repeated infection causes damage which further impedes the clearance of mucus. The airway dilation and consequent further impairment of mucociliary clearance combine to further increase susceptibility to repeated infection in the lungs.

Minor discrepancies in figures quoted for COPD can occur if there are different age cut offs, if bronchiectasis (ICD 10: J47) or asthma (ICD 10: J45, J46) are included or if only COPD exacerbations (ICD 10: J44.1) are included.

National Healthcare Quality Reporting System (NHQRS) hospitalisation data quoted in this chapter is based on Irish COPD returns to OECD i.e. age-sex standardised rate of hospitalisations of people aged 15 years and older with a principal diagnosis of chronic obstructive pulmonary disease (COPD) per 100,000 population i.e. ICD-10-AM/ACHI J41 (simple and mucopurulent chronic bronchitis), J42 (Unspecified chronic bronchitis), J43 (Emphysema), J44 (Other chronic obstructive pulmonary disease), J47 (Bronchiectasis) or J40 (Bronchitis) with a secondary diagnosis of J41, J43, J44 or J47[6].

Mortality data accessed from Public Health Information System (PHIS), including that referenced from Health in Ireland Key Trends 2017[7], quoted in this chapter, reflects that of Eurostat 65 causes of death shortlist named "Chronic Lower Respiratory Disease" which cover ICD 10 codes J40-47 ie asthma is included (J45,J46). In the sections Mortality and Age, deaths assigned to codes J40-47 are listed, as are the same deaths but excluding asthma (J45, J46)[7].

The Irish hospitalisation data (HIPE) in the sections Impact on health services, Gender and Age are based on the International Classification of Disease, 10th revision (ICD-10) codes J40–J44 and J47, i.e. chronic obstructive pulmonary diseases which includes bronchiectasis (J47) which is in line with codes used in ERS White Book[1].

The discussion below unless stated otherwise refers to COPD including bronchiectasis.

Incidence and Prevalence

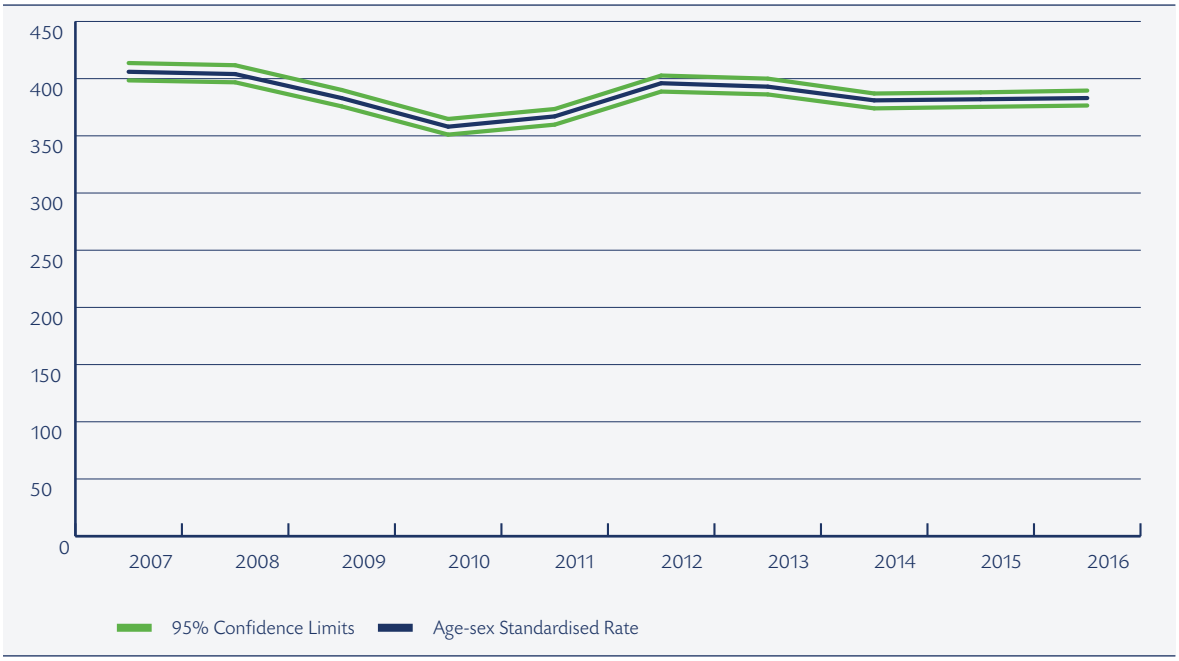
Neither COPD incidence nor prevalence data is available for Ireland at national level. Despite the burden of COPD, as evidenced by hospitalisation rates and mortality rates below, national prevalence studies using international protocols have not been conducted. Various estimates of prevalence have been made based on prevalence studies from other countries. One estimate, based on extrapolation of a study in Salzburg[8] which used the internationally recognised Burden of Obstructive Lung Disease (BOLD) methodology, is that almost 500,000 people aged 40 years and over in Ireland could have COPD, of whom over 200,000 have moderate or severe disease and only half are likely to be diagnosed. This estimate was based on the 2011 population[6]. The Salzburg study was chosen given its relatively high prevalence compared to other locations and in light of Ireland's high hospitalisation rate for COPD. An 8% prevalence of chronic bronchitis among 20-44 years olds in Ireland (45% of whom smoked) was reported in an international study in 2001[9]. In another international report in the same period Ireland was amongst five countries where the prevalence of moderate COPD in 20-44 year olds was 5% or higher[10].

Alpha-1 antitrypsin deficiency (AATD) affects over 15,000 people on the island of Ireland, with another 250,000 carriers also at risk of lung and liver disease[4]. An Irish study of a randomly selected sample of 1,100 plus a targeted population reported that in the former, 1 in 25 were heterogenous for Z allele and 1 in 10 heterogenous for S allele. Of importance was that 1 in 2,104 were ZZ homozygous, 1 in 424 were SZ heterozygous and 1 in 341 SS homozygous[5]. Of the targeted population, 27.1% had at least 1 mutation[5]. As the cohort only identified Z and S alleles, this is likely to underestimate the prevalence of AATD in Ireland.

On the National Alpha-1 voluntary Register, 56% have ZZ phenotype (56.4% males, 43.6% female) while close to another 25% have the SZ phenotype (moderate AATD)[4,12].

In the absence of population prevalence data for COPD, hospitalisation rates may be a proxy for those with more severe disease. The national age-sex standardised hospitalisation rate for COPD in 2016 was 389 per 100,000 population which compared with 406 hospitalisations per 100,000 population in 2007[6].

Figure 4.1. Age-sex standardised hospitalisation rates for COPD per 100,000 population in Ireland, 2007 - 2016



Source: National Healthcare Quality Reporting System Annual Report 2017[6]

Table 4.1. Chronic lower respiratory disease: ICD 10 J40-47. Standardised death rate, 2007-2016

Year	Total J40-47	Asthma (J45,46) excluded	/100,000 population	5yrs	Standarised Mortality Rate
2007	1,496	1435	34.19	2003-07	63.07
2008	1,365	1313	30.43	2004-08	60.61
2009	1,516	1463	33.41	2005-09	60.89
2010	1,334	1490	29.28	2006-10	59.24
2011	1,514	1458	32.78	2007-11	59.11
2012	1,587	1548	34.55	2008-12	58.05
2013	1,657	1609	35.91	2009-13	58.55
2014	1,551	1514	33.39	2010-14	57.73
2015	1,701	1627	36.29	2011-15	59.21
*2016	1,711	1639	36.10	2012-16	58.81

*Source: Public Health Information System(PHIS) * Provisional data for 2016*

Mortality

In 2016, chronic lower respiratory disease (ICD 10: J40-47) was second only to lung cancer as a cause of death from respiratory disease. The disease is responsible for more deaths than any non-respiratory cancer and is Ireland's fourth biggest killer[7].

The five year standardised mortality rates for chronic lower respiratory disease (ICD 10: J40-47) for the decade 2007 - 2016 are shown in table 4.1. All columns except the 3rd column relate to ICD 10: J40-47 but given the relatively small difference in numbers between the 2nd and 3rd column, the data largely relates to COPD.

In 2016, there were 1,711 deaths registered as chronic lower respiratory disease (ICD 10: J40-47) of which 96% (1,639) were due to COPD (ICD 10: J40-44,47)[13]. The figures for 2015 were 1,701 deaths registered as due to chronic lower respiratory disease (codes J40-47) of which 95.6% (1,627) were due to COPD. Of this latter group, 51 (3%) were due to bronchiectasis (ICD 10: J47)[14].

Impact on health services

COPD is a disease largely managed in primary care by the patient, their GP and primary care team. Data on COPD is not available at a national level for people with full medical cards, those with GP only cards or those who are private patients. This is also true for those who attend GP out of hours services, those who attend Emergency Departments and those who attend hospital Outpatient Departments. Inpatient or day case activity is only available from HIPE reporting publicly funded hospitals. Data is not available nationally on those requiring respiratory aids and appliances including oxygen.

Respiratory medication use

Analysis of 2013 PCRS (Primary Care Reimbursement Scheme) data for patients over the age of 40 years reported that between the General Medical Services (GMS) and the Drugs Payment Scheme (DPS), pharmacy claims for inhalers for COPD cost in excess of €90 million. Of this, approximately 55% was spent on inhalers containing a combination of inhaled corticosteroid (ICS) and long-acting beta$_2$ agonist (LABAs), corresponding to an average of approximately 68,500 prescriptions per month[15]. In 2016, expenditure on medications prescribed for COPD (R03AK - adrenergic in combination with corticosteroids or other drugs for obstructive airway disease airway, and R03BB - anticholinergics, and R03AL-adrenergics in combination with anticholinergics) accounted for approximately €67.6 million in the GMS population[16]. This figure, representing expenditure for the GMS population alone, grossly underestimates the total expenditure on pharmaceuticals for the management of COPD in Ireland.

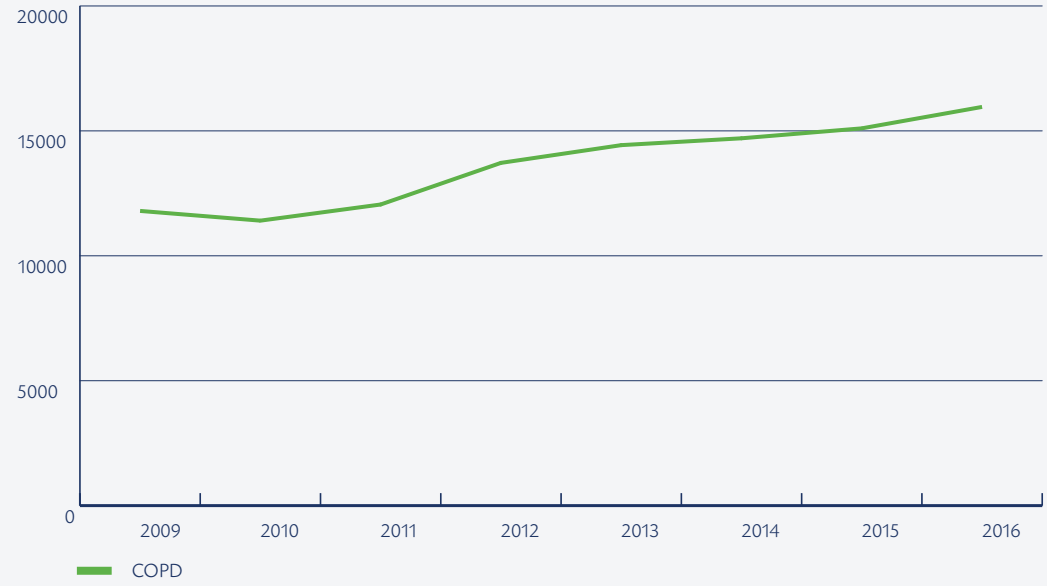
An analysis of the same dataset (PCRS-GMS) data found that of those with full GMS coverage for the entire of 2016, prevalence of medication use consistent with a diagnosis of COPD increased significantly with age, and also showed gender differences[17]. Prevalence of medication use was higher in females than males up to the age of 65 years, after which prevalence of medication use amongst males surpassed those of females, though the difference was minimal. Using a broader definition (see table 4.2 below: definition 2), prevalence of medication use consistent with a diagnosis of COPD increased from 7.5% of males aged 45-55 years, to 21.7% in those aged 75 years and over. The figures for females were 10.1% for those aged 45-55 years, and 18.9% for those aged over 75 years. Restricting the analysis to just those dispensed a long-acting muscarinic receptor antagonist (LAMA) in 2016 (definition 1), prevalence estimates in males

Table 4.2. Prevalence of medication use to manage COPD in the GMS population

Age and over	Males (%) 95% CI				Females (%) 95% CI			
	Definition 1		Definition 2		Definition 1		Definition 2	
45-55yrs	2.6%	2.5 to 2.7	7.5%	7.3 to 7.6	3.3%	3.2 to 3.4	10.1%	16.1 to 16.4
55-64yrs	6.9%	6.7 to 7.1	12.9%	12.7 to 13.1	8.2%	8.0 to 8.4	16.4%	17.9 to 18.2
65-69yrs	10.0%	9.7 to 10.3	17.2%	16.8 to 17.6	9.2%	8.9 to 9.5	17.9%	18.4 to 18.8
70-74yrs	11.1%	10.9 to 11.4	19.0%	18.6 to 19.3	9.4%	9.2 to 9.7	18.6%	18.6 to 19.0
75yrs & over	11.3%	11.1 to 11.6	21.7%	21.4 to 21.9	8.0%	7.9 to 8.2	18.9%	16.1 to 16.4

*Source: Hurley, E (2018). An analysis of medication use for respiratory disease amongst those with GMS eligibility (2015 - 2016) - a focus on Chronic Obstructive Pulmonary Disease (COPD)[17]. Definition 1: were dispensed at least one prescription for a LAMA (with or without a LABA) *Definition 2: were dispensed at least one prescription for a LAMA (with or without a LABA), an ICS & LABA combination, OR a SAMA (with or without a SABA) in 2016.*

Figure 4.2. Inpatient hospitalisations with a primary diagnosis of COPD, 2009-2016



Source: HIPE 2009-2016. All hospitals reporting data to HIPE

increased from 2.6% in those aged 45-55 years to 11.3% in those aged 75 years and over. In females the corresponding figures were 3.3% and 8.0%.

Impact on hospitals

In the earlier section on prevalence, inpatient hospitalisations were shown standardised for the population. The figure above reflects the increasing burden on hospital services in terms of inpatient hospitalisations for the years 2009-2016.

For bronchiectasis alone (ICD 10: J47) (primary diagnosis), the increasing impact in terms of both inpatient hospitalisations and especially day case admissions between the years 2009-2016 is evident from the table below. There is also an increasing trend for those who require inpatient hospitalisation to be admitted as emergencies.

Table 4.3. Hospitalisations with a primary diagnosis of Bronchiectasis (J47)

Year	Total Hospitalisations	Inpatient Hospitalisations	Inpatient Bed Days	Day case	Emergency Hospitalisations	Emergency as % of inpatients
2009	704	450	3,547	254	284	63.1%
2010	704	321	2,922	383	228	71.0%
2011	738	338	2,890	400	247	73.1%
2012	952	464	3,470	488	326	70.3%
2013	1,070	480	3,389	590	376	78.3%
2014	1,131	502	3,448	629	402	80.1%
2015	1,136	492	4,023	644	373	75.8%
2016	1,132	499	3,959	633	412	82.6%

Source: HIPE 2009-2016. All hospitals reporting data to HIPE Note: these numbers are also included in figure 2

Table 4.4. Inpatient hospitalisations with a primary diagnosis of COPD in adult acute hospitals, 2009-2016 (adults ≥35yrs)

Year	Discharges COPD	% of all inpatient discharges	Rate / 100,000 population ≥35 years	Bed days used COPD	% of all inpatient bed days used	Mean & LOS (SD)	Median & LOS (IQR)
2009	11,026	3.6%	507	102,907	4.1%	9.3 (13.5)	6 (3-10)
2010	10,615	3.5%	478	98,718	4.0%	9.3 (15.4)	6 (3-10)
2011	11,364	3.7%	500	99,269	4.1%	8.7 (13.2)	6 (3-10)
2012	13,059	3.9%	567	105,132	4.3%	8.0 (13.2)	5 (3-9)
2013	13,830	4.0%	590	109,048	4.4%	7.8 (13.5)	5 (2-9)
2014	14,140	3.9%	591	111,349	4.4%	7.8 (11.7)	5 (2-9)
2015	14,489	4.0%	592	115,593	4.4%	7.9 (12.1)	5 (2-9)
2016	15,460	4.1%	614	119,787	4.5%	7.7 (11.8)	5 (2-9)

Source: Hurley, E(2018). Trends in hospitalisations for Chronic Obstructive Pulmonary Disease (COPD), 2009-2017.[18] Note: Inpatient activity in adult acute public hospitals. Denominator is all inpatient discharges in those hospitals in adults aged 35 years and older. CSO census data (2011,2016) and CSO population estimates for other years provide denominator data for rate of discharges per 100,000 population. &Inpatients with same day discharge (example those admitted and discharged from an Acute Medical Assessment Unit) are given a length of stay of 0.5 in the calculation of average length of stay (LOS), and a bed days used of one.

COPD accounted for 17,448 (1.0%) hospitalisations and 126,336 (2.7%) bed days in 2016. Omitting day case admissions, COPD accounted for 17.3% (15,959) of respiratory inpatient hospitalisations (2.5% of inpatient hospitalisations) and 21.7% (124,847) of respiratory inpatient bed days (3.4% inpatient bed days) in 2016 in all hospitals reporting activity to HIPE.

Restricting to adult acute hospitals only, episodes of care with a primary diagnosis of COPD accounted for 4.1% of inpatient hospitalisations and 4.5% of bed days amongst adults aged 35 years and over in 2016 (table 4.4) [18]. COPD is the commonest disease-specific cause of emergency hospitalisation of adults in Ireland[6]. COPD in 2016 accounted for 15,262 (3.6%) of all emergency hospitalisations (19.5% of respiratory emergency hospitalisations) and 117,626 (4.6%) of emergency bed days (22.6% of respiratory emergency bed days) across all ages in hospitals reporting to HIPE. The Activity in Acute Public Hospitals report for 2016 reported that of those admitted with COPD as inpatients, 38.7% were classified as major complexity and had median and mean length of stay of 7 and 10.7 days respectively[19].

The crude in-hospital mortality rate for those with a principal diagnosis of COPD was 3.6 deaths per 100 admissions in 2016, a reduction from 4.6 in 2007[20]. In 2016, the in-hospital mortality SMR (99.8% Control Limits) ranged from 29 (23-190) to 169 (27-187)[20].

Gender

In the five year period, 2012-2016, of those who died from chronic lower respiratory disease (ICD 10: J40-47) there were almost an equal number of males and females. However, the age standardised death rate for males was 74.95 while that for females was 49.80[13]. In the five years 2011-2015, of the 267 deaths due to bronchiectasis alone (ICD 10: J47), 53.6% (143) were in females [14].

In 2016, of the 1,711 deaths for chronic lower respiratory disease (ICD 10: J40-47)(96% were due to COPD (ICD 10: J40-44,47)), 50.8% were males and 49.2% females. The standardised death rate for males was 71.56 while that for females was 48.51. The percentage of bronchiectasis (ICD 10: J47) deaths which occurred in females in 2015 was 58.8%[14].

Of the hospitalisations in 2016 with COPD, 50.3% were females and 49.7% were males. Of those hospitalised in 2016 with bronchiectasis, 61.0% were females and 39.0% were males.

Age

The majority of deaths from chronic lower respiratory disease (ICD 10: J40-47) and more specifically COPD (ICD 10: J40-44, 47) occur in those aged 70 years and over. This is shown in the table below. All columns except the 4th column relate to ICD 10: J40-47 but given the relatively small difference in numbers between the 3rd and 4th column, the data largely relates to COPD. The age standardised mortality rate (ICD 10: J40-47) in 2016 was 57.05. By way of comparison, the rates for the years 2007, 2011 and 2015 were 64.8, 57.8 and 59.0 respectively. Over this 10 year period the rate reduced by 12.0%.

In 2016, of the 204,882 hospitalisations for those aged 65 years and over, 11,948 (5.8%) were for COPD. Of the 1,946,040 inpatient bed days for the same age group, 101,842 (5.2%) were for patients with COPD. Of the 15,959 admissions and 124,847 inpatient bed days for COPD in 2016, 75% of patients were aged 65 years and over who used 81.6% of COPD inpatient bed days. For those aged 16-64 years, COPD accounted for 1.1% of all inpatient hospitalisations in 2016 and 1.6% of inpatient bed days.

The mean and median age of those hospitalised in 2016 with bronchiectasis was 62 years and 66 years respectively.

Regional variation

It is not known whether there are regional differences in COPD prevalence as opposed to hospitalisations and mortality. There is however evidence of geographical variations in the detection of AAT deficiency[4]. Higher numbers of the MZ mutation have been detected in Cork, Dublin, Donegal and Limerick but it is unclear how much this is due to true differences and how much is due to testing[4].

There is evidence of geographic variation in factors which contribute to air quality in Ireland[3]. There are also variations both in mortality from chronic lower respiratory disease (ICD 10: J40-47) as shown in figure 4.3 below and in COPD hospitalisation rates (ICD 10: J40-44,47) as shown in figure 4.4.

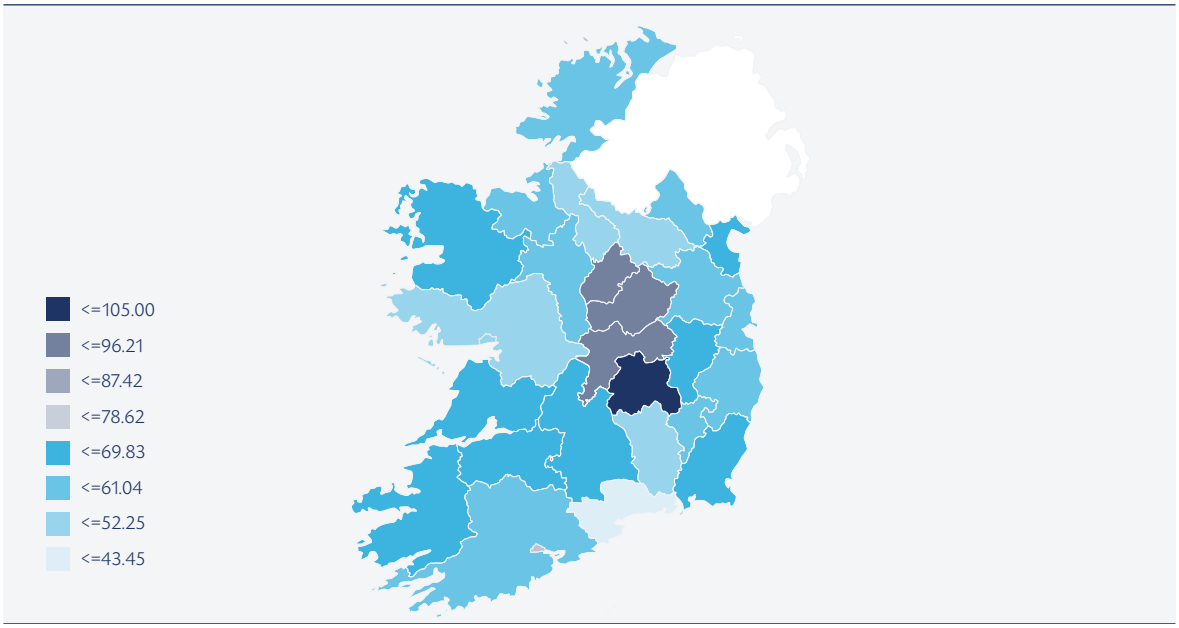
During the three year period from 2014-2016, the age-sex standardised hospitalisation rate by county of residence ranged from 254 hospitalisations per 100,000 population in Kerry to 600 hospitalisations per 100,000 population in Offaly [6].

Table 4.5. Chronic Lower Respiratory Disease (ICD 10: J40-47) Deaths and Years of Potential Life lost (YPLL): 2007-2016

Year	Standarised Mortality Rate all ages J40-47	Deaths J40-47	Deaths J45,46 excluded	Deaths J40-47 age <70yrs (%)	YPLL up to 70 yrs J40-47	YPLL/100,000 population J40-47
2007	64.79	1,496	1435	197 (13.2%)	1765	44.7
2008	57.27	1,365	1313	192 (14.1%)	1620	40.7
2009	62.00	1,516	1463	200 (13.2%)	1549	38.8
2010	53.19	1,334	1490	209 (15.7%)	1667	40.4
2011	57.81	1,514	1458	227 (15.0%)	1966	45.5
2012	59.84	1,587	1548	236 (14.9%)	1766	42.3
2013	61.55	1,657	1609	247 (14.9%)	1931	45.6
2014	55.77	1551	1514	226 (14.6%)	1740	40.5
2015	59.03	1701	1627	237 (13.9%)	1965	47.2
*2016	57.05	1711	1639	261 (15.2%)	2186	47.8

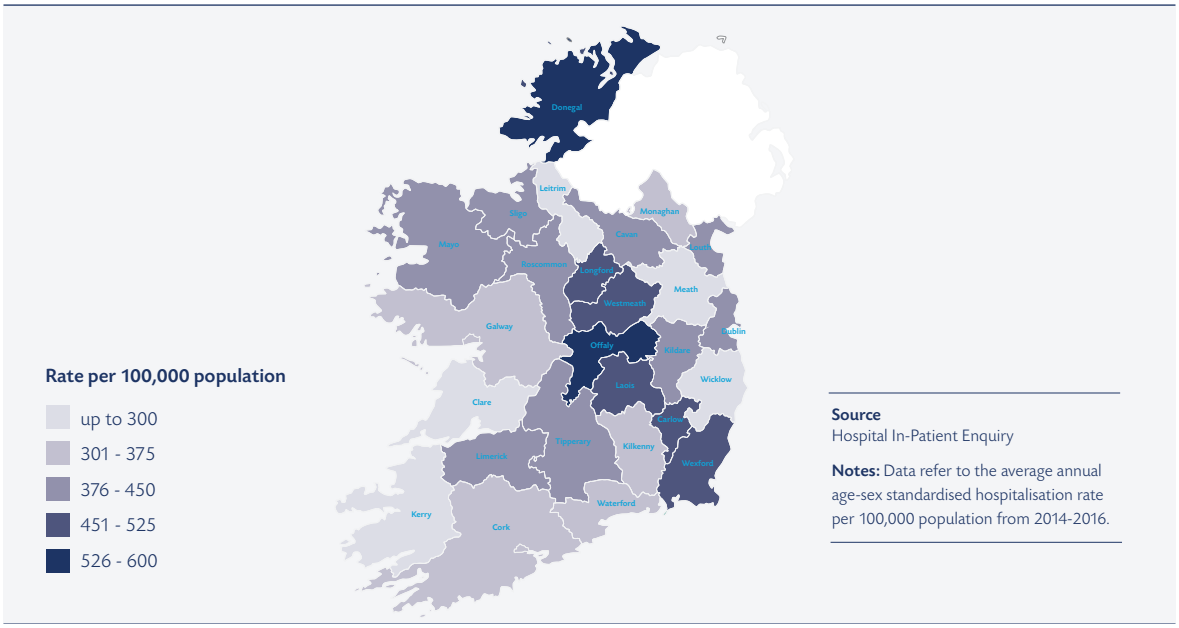
*Source: Public Health Information System (PHIS) *Provisional data for 2016*

Figure 4.3. Standardised death rate, all ages, 2012-2016. Chronic Lower Respiratory Disease (ICD 10: J40-47)



Source: Public Health Information System (PHIS) (provisional data for 2016)

Figure 4.4 Age-sex standardised hospitalisation rates for COPD per 100,000 population in Ireland, 2014 - 2016



Source: National Healthcare Quality Reporting System Annual Report 2017. Figure 21[6]

Socio-economic analysis

In Ireland, socio-economic variation for COPD mortality is more striking than for lung cancer which suggests that factors in addition to smoking come into play for COPD[21]. Data for the period 2007-2012 showed a difference in COPD mortality in the order of 303%, in the lower socio-economic groups compared with the higher groups for males aged over 15 years. For those aged 15-64 years, the excess was even higher at 366% [14, 21].

A difference in prevalence of COPD between socio-economic groups is also to be expected. A small study on two traveller sites in 2015 (54% of participants were females), reported an obstructive pattern of lung disease among 23% of participants who were aged 18-69 years[22].

International comparisons

COPD affects more than 200 million people in the world, 65 million of whom have moderate or severe airway disease [23]. Most studies show it is under-diagnosed by 72 to 93%[24]. Misdiagnosis is also common[25].

Ireland's prevalence of chronic bronchitis among 20-44 year olds in 2001 of 8% was in contrast to European median prevalence of 2.6%[9]. While the age group did not represent the usual age profile of COPD patients, it did indicate that COPD could be a significant problem in Ireland which was also suggested by another international survey which showed that Ireland was amongst five countries with a prevalence of moderate COPD in 20-44 year olds of 5% or higher[10].

Multicentre surveys of COPD in single countries have been coordinated in the European Community Respiratory Health Survey (ECRHS) and the Burden of Obstructive Lung Disease (BOLD) study. Most estimates of COPD prevalence from such large-scale studies are between 5% and 10% and all show an increase with age[1]. In 2008, incidence rates in the UK were 185 per 100,000[26]. It is estimated that 1 in 7 Australians aged over 40 years have COPD, of whom half are undiagnosed[27].

In terms of alpha-1 antitrypsin deficiency, throughout Europe the frequency of the Z and S mutations varies widely between countries, geographic regions, and ethnic groups[28]. The highest frequency of the S allele is found in the Iberian Peninsula with a mean gene frequency of 0.0564. The frequency of 0.0541 for the S mutation in Ireland is among the highest in Europe, and similar to the Iberian Peninsula. The frequency of the Z variant is highest in northern and western European countries, peaking in southern Scandinavia with a gene frequency of >0.02. The frequency of 0.0218 for the Z allele in the Irish population is also among the highest in Europe[29].

Prevalence of bronchiectasis in the USA ranged from 4 per 100,000 in people aged 18–34 years to 272 per 100,000 in those over 75 years of age in 2005[1]. In New Zealand, the reported prevalence is 3.7 per 100,000 population but this varies according to ethnicity[1]. In Europe, age-standardised hospitalisation rates vary from < 2 to > 6 per 100,000 population. The estimated average annual age-adjusted hospitalisation rate in a US study was 16.5 hospitalisations per 100,000 population[1]. However, as is the case in Ireland, many countries report bronchiectasis as part of COPD.

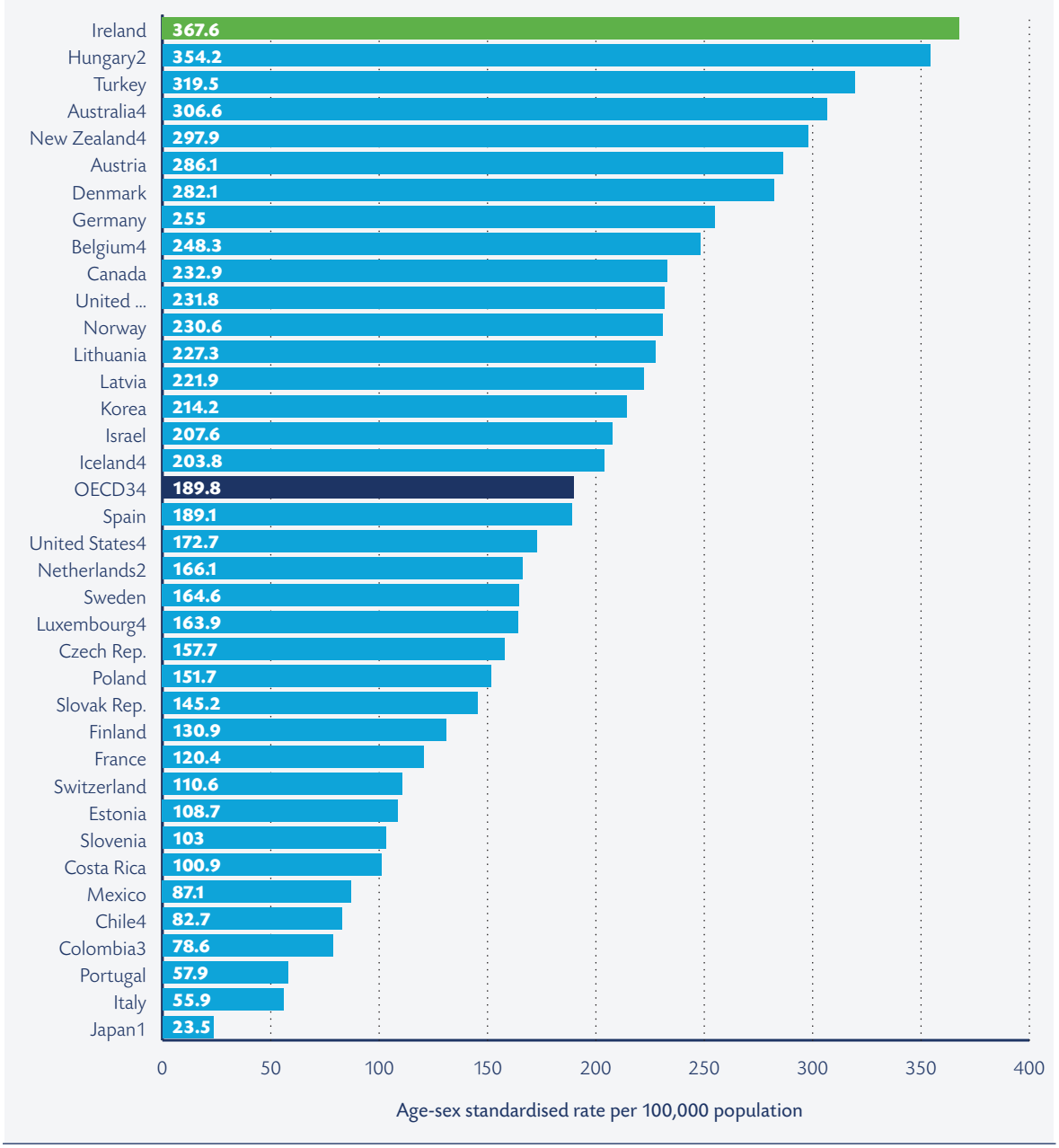
Deaths registered as due to chronic lower respiratory disease are likely to be under-estimates, as people with COPD often succumb to its co-morbidities. While the size of this under-estimation is unknown in Ireland, the literature would suggest that for more than 60% of people with COPD, a co-morbidity other than COPD may be listed as the primary cause of their death[30, 31].

Overall, the age-standardised mortality rate for COPD in the WHO European region is about 18 per 100,000 people per year but the variation between countries in 2011 within the region was more than 10-fold[1]. Ireland's age standardised COPD mortality rate of 27.87/100,000 population was the 5th highest in WHO Europe and 3rd highest in the EU.

The Global Burden of Disease study (2015) reported an age-standardised mortality rate for COPD of 51.7 (CI: 50.0-53.4) which was a reduction of 22.9% (CI: 25.4-20.0) compared with the 2005 figure of 67.0 (CI: 64.8-69.9)[32].

In 2013 (the latest year for which OECD data is currently available), the age-sex standardised hospitalisation rate for COPD in Ireland was 395 per 100,000 population, which was significantly higher than the OECD average of 201 hospitalisations per 100,000 population[6]. Ireland has the highest rate among the selected OECD countries, as shown in the figure below. This difference may be due, in part, to differences in how countries code their hospitalisation data; Ireland uses the ICD-10-AM/ACHI coding system and other countries that use this system were also above the OECD average. This caveat notwithstanding however, differences in coding alone cannot explain why hospitalisation rates in Ireland are the highest among all of the countries listed[6].

Figure 4.5. Age-sex standardised hospitalisation rates for COPD per 100,000 population for selected OECD countries, 2013 (or nearest year)



Source: National Healthcare Quality Reporting System Annual Report 2017. Figure 20[6]

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