Rich European countries have higher atrial fibrillation death rates than least wealthy

26 January 2021

*Age-adjusted **incidence** rates per 100,00 in 1990 and 2017 in all countries studied.*

Countries	Incidence Male		Incidence Female	
	1990	2017	1990	2017
Austria	68.062	68.414	45.355	52.364
Belgium	62.630	56.116	42.599	37.384
Bulgaria	54.802	51.919	36.447	34.69
Croatia	51.925	48.292	34.336	26.644
Czech Republic	59.045	59.642	37.627	36.819
Denmark	68.503	62.983	47.676	40.632
Finland	71.305	69.028	45.841	42.278
France	68.388	57.887	43.994	36.557
Germany	72.404	64.937	40.436	35.744
Greece	62.853	55.094	36.339	33.61
Hungary	62.592	57.972	41.716	38.88
Ireland	61.405	58.72	37.757	34.416
Italy	67.352	59.248	47.031	33.726
Netherlands	68.195	59.405	40.982	34.343

Age-adjusted incidence rates per 100,00 in 1990 and 2017 in all countries studied. Credit: *European Heart Journal*

The wealthiest countries in Europe have higher death rates from atrial fibrillation than the least wealthy and these death rates are increasing more rapidly than incidence rates, according to the first analysis of its kind published in the *European Heart Journal* today. The study also found that women who developed the condition were more likely than men to die from it in all 20 European countries studied.

The researchers believe the difference between countries could be due to lifestyle factors, such as increased obesity and alcohol consumption in wealthier countries, or what is known as the 'survivor effect', where people live for longer due to better treatments for other diseases such as cancer, leaving greater numbers of more elderly people to die from diseases of the heart or circulatory system, such as atrial fibrillation.

Atrial fibrillation is a condition in which the heart beats at an abnormal and often rapid rhythm. It is one of the most commonly diagnosed heart rhythm disturbances and it can lead to stroke and heart failure. Until now, it's been unclear whether trends in deaths from atrial fibrillation vary between European countries and between men and women, and whether they have improved over time.

Professor Markus Sikkel, adjunct associate professor at the University of Victoria and clinical assistant professor at the University of British Columbia, Victoria, Canada, and Dr. Becker Al-Khayatt, a cardiology specialist registrar at Croydon Heart Centre, Croydon University Hospitals NHS Trust, London, UK, led a team of researchers to analyse data from the Global Burden of Disease Study on incidence and deaths from atrial fibrillation between 1990 and 2017 in 20 European countries. They looked at trends over the 28-year period and calculated the mortality-to-incidence ratio (MIR) by dividing the numbers of deaths by the numbers of cases for each country. MIRs help to identify if a country has a higher or lower death rate per case diagnosed.

They found enormous variation between countries and there was no overall identifiable trend either towards or away from improved incidence and death rates, although the incidence of atrial fibrillation was consistently higher in men than in women in all countries throughout the study period.

*Age-adjusted **mortality** rates per 100,000 in 1990 and 2017 in all countries studied.*

Countries	Mortality Male		Mortality Female	
	1990	2017	1990	2017
Austria	5.699	6.359	5.498	6.209
Belgium	5.713	5.624	5.654	5.113
Bulgaria	5.316	5.787	3.914	4.098
Croatia	3.811	3.713	3.612	2.874
Czech Republic	4.397	4.241	3.989	3.801
Denmark	6.207	7.807	5.442	6.226
Finland	5.141	5.296	5.111	5.013
France	5.645	4.733	5.423	4.322
Germany	6.348	6.938	5.053	6.654
Greece	5.829	5.622	4.06	4.529
Hungary	4.698	4.024	4.346	3.631
Ireland	6.389	6.196	5.951	5.623
Italy	5.328	5.290	5.563	4.509
Netherlands	6.247	5.522	5.535	4.796
Poland	5.152	5.405	4.292	4.508
Portugal	5.162	4.138	4.93	3.694
Romania	3.502	3.689	3.849	3.645
Spain	5.436	5.062	5.887	4.959
Sweden	5.029	8.829	6.733	8.877
United Kingdom	5.519	5.5	5.522	5.509

Age-adjusted mortality rates per 100,000 in 1990 and 2017 in all countries studied. Credit: *European Heart Journal*

Austria, Denmark and Sweden experienced peaks in incidence in the middle of the study period, while in nations with lower gross domestic product (GDP) there was less variability with a steady decline in incidence over the years, with a few exceptions. For example, in Portugal there was a sharp drop in incidence (-6% in men and -8% in women per year) between 2006-2009; in Italy there was a sharp rise in incidence in men between 1995-2001 (+3.5% per year); in Croatia incidence rates declined to the lowest levels in Europe in the first 10-20 years of the study (down to 39 per 100,000 men in 2000 and 24 per 100,000 women in 2006), but then rose sharply in men between 2006-2010 (+2.5% per year) and more slowly in women between 2010-2017 (+1.2% per year).

Death rates were highest in wealthier countries, reflecting the incidence in Austria, Denmark and Sweden. Sweden had the highest death rates for both men and women: 9 per 100,000 of the population in 2017, with a sharp 6% increase per year in male death rates between 2001-2006. In Sweden and Denmark, the mortality rates did not decline following the initial rise, unlike the incidence rates, and were among the highest in Europe by 2017. Germany also had a rapid and sustained increase in death rates throughout the 2000s, particularly in women, in whom they rose by 4% per year to 7 per 100,000 in 2017.

Mortality-to-incidence ratios stayed roughly the same for many countries over the 28 years, although increases occurred in Sweden, Germany and Denmark in both men and women. MIRs were consistently higher for women than men. The differences varied from relatively small in Bulgaria where the MIR was 5.4% higher in women than men in 2017, to large in Germany where the MIR in women was 74.5% higher than in men. In Austria the opposite occurred, with the disparity decreasing from 45.7% higher in women than men in 1990 to 19% higher in 2017.

Prof. Sikkel said: "The ratio of deaths to cases of atrial fibrillation in Europe has not improved over time and, in many European countries, it is actually increasing despite apparent advances in treatment and care. We think this could be due to differences in lifestyles in wealthier western European countries, where risk factors such as obesity, alcohol consumption and sedentary behaviour are more prevalent than in less wealthy, eastern European countries.

"The second important factor, in our view, is that patients in richer countries may survive long enough from other illnesses such as ischaemic heart disease and cancer, and then succumb to diseases that are more difficult to treat successfully: heart failure related to atrial fibrillation is one of these. Another possibility is that atrial fibrillation is less well recognised in poorer countries in a systematic way. We think this is likely to be a real difference and not just an artefact of better documentation in richer nations judging by the findings of previous studies."

Mortality to incidence ratios (MIRs) in 1990 and 2017 in all countries studied.

Countries	MIR Male		MIR Female	
	1990	2017	1990	2017
Austria	0.084	0.093	0.121	0.119
Belgium	0.091	0.1	0.133	0.137
Bulgaria	0.097	0.111	0.107	0.118
Croatia	0.073	0.077	0.105	0.108
Czech Republic	0.074	0.071	0.106	0.103
Denmark	0.091	0.124	0.114	0.153
Finland	0.072	0.077	0.111	0.119
France	0.083	0.082	0.123	0.118
Germany	0.088	0.107	0.125	0.186
Greece	0.093	0.102	0.112	0.135
Hungary	0.075	0.069	0.104	0.093
Ireland	0.104	0.106	0.158	0.163
Italy	0.079	0.089	0.118	0.134
Netherlands	0.092	0.093	0.135	0.14
Poland	0.086	0.083	0.109	0.107
Portugal	0.087	0.098	0.128	0.143
Romania	0.065	0.078	0.105	0.112
Spain	0.083	0.093	0.122	0.125
Sweden	0.063	0.11	0.142	0.188
United Kingdom	0.079	0.077	0.127	0.126

Mortality to incidence ratios (MIRs) in 1990 and 2017 in all countries studied. Credit: *European Heart Journal*

Dr. Al-Khayatt said: "The gender disparity between men and women has persisted over many years in Europe and is rarely commented on. It is highly variable between nations and the cardiology community needs to work out why that is and whether different countries can learn from each other to reduce the disparity.

"We feel there are multiple factors behind this disparity, with healthcare inequality between men and women, as well as intrinsic biological differences being plausible explanations. There is some evidence that women are diagnosed later and treated less aggressively than men."

Limitations of the study include possible variations between countries in the data; data were not available for factors that could affect the results such as social class, obesity, smoking and alcohol use; atrial fibrillation and heart flutter were classified together although they carry different risks; and although there were differences between European countries in wealth, they are all still relatively wealthy compared to some other countries in the world.

In an accompanying editorial, Professors Michiel Rienstra and Isabelle Van Gelder, of the University Medical Center Groningen, The Netherlands, write: "The authors should be congratulated for their excellent contribution to our knowledge on the diversity of incidence of AF and AF-related mortality in Europe . . .it is interesting that both incidence and mortality are heterogeneous throughout Europe. This diversity may be explained by the fact that Europe is a non-homogeneous region."

They conclude: "This study emphasizes the diversity of incidence of AF and AF-related mortality throughout Europe. It underlines the differences in integrated AF care and access to it, and the clinical profile of AF patients in Europe. In addition, sex differences are emphasized. It is a call for more research in individual countries and more multinational studies including Western and Eastern European countries."

More information: Becker M Al-Khayatt et al, Paradoxical impact of socioeconomic factors on outcome of atrial fibrillation in Europe: trends in incidence and mortality from atrial fibrillation, *European Heart Journal* (2020). DOI: 10.1093/eurheartj/ehaa1077

Provided by European Society of Cardiology