*Intensive Care Med*
https://doi.org/10.1007/s00134-018-5307-5

LETTER

# Public awareness of sepsis is still poor: we need to do more

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Dear Editor,

Sepsis is a major concern worldwide due to high morbidity, mortality and financial cost to health systems [1]. Globally, there is an estimated 30 million cases of sepsis each year, which results in more than 6 million deaths [2]. The lack of public awareness of sepsis and the serious consequences of delays in recognition and treatment are a major contributor to the alarming annual increase of 8–13% in sepsis cases over the last decade. With sepsis representing one of the highest causes of death in Ireland, the objective of this study was to assess awareness and perception of sepsis by the general public.

This was a face-to-face survey of adults aged 16 years and older, conducted in January 2018. Prior to beginning the survey, informed consent was obtained from all participants in full compliance with the guidelines set out by the institutional review board of the European Society for Opinion & Market Research (Register J8812). The survey was performed by an independent national research agency (Behaviour and Attitudes; www.banda.ie) in their homes using Coherent Accelerator Processor Interface units. Current figures from the Irish central statistics office indicate that the national population in 2018 was 4,803,748. To obtain a confidence interval of 95% and a confidence level of 3%, a sample size of 1004 adults was defined as a target population. The 1004 adults were chosen randomly by the independent national research agency. Quotas were placed on the sample by gender, age, region and social class to ensure that it was fully representative of the Irish population aged 16 years and older. No drop-out or missing data were discovered. The survey instrument was an unprompted questionnaire which contained two questions modified from a previous international survey by Rubulotta et al. The first question was "Do you know what the following medical conditions are—Heart attack, Asthma, Breast Cancer or Sepsis". Respondents who answered yes to sepsis were asked "In as much detail as possible, can you describe what sepsis is". We considered the following definitions of sepsis to be correct answers: blood poisoning, blood infection, septic shock or septicaemia. Statistical analysis was carried out using Askia (Los Angeles, CA, USA).

The survey population was gender-balanced, with 506 (50.4%) female and 498 (49.6%) male respondents. The under-24-year-olds displayed significantly lower awareness of sepsis than all other age groups ($P < 0.05$). While only 291 of 1004 (29%) Irish adults defined sepsis according to our criteria above (95% Cl, 0.252–0.308), a large number were not aware of sepsis (713 of 1004, or 71%; 95% Cl, 0.692–0.748). Of those who indicated an awareness of sepsis, a high number indicated they knew what heart attack (933 respondents or 93%), asthma (933 respondents or 93%) or breast cancer (923 respondents or 92%) meant. There were no significant differences in sepsis awareness based on gender (301 female responders or 30% compared to 261 male responders or 26%; $P =$ NS). When analyzing by age range, we observed that 302 of 1004 respondents (30%) in the middle age group (35–49 years) claimed the highest level of awareness of sepsis, whilst 126 of 1004 respondents (or just 12.5%) in the younger group (under 24 years of age) claimed the lowest awareness (Fig. 1a). Finally, geographic location data indicated that significantly more people living in rural Ireland (361 of the 1004 respondents, or 36%) displayed greater awareness regarding sepsis then those living in urban Ireland (230 of the 1004 respondents, or 23%; $P < 0.01$).

Our results suggest that Irish public awareness about sepsis is much lower than that for other medical

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conditions such as heart attack, asthma or breast cancer. Whilst every disease is important, there is an urgent need for sepsis awareness campaigns among the population, as research shows that rapid, effective sepsis treatment is associated with better outcomes [3]. The main difference between sepsis and other life-threatening conditions such as myocardial infarction or stroke is that sepsis does not have hallmark symptoms such as chest pain or limb weakness, respectively, that could be easily recognized by the general, non-medical population. Non-specific signs and symptoms such as confusion, disorientation, high heart rate, fever, shivering and clammy skin are not frequently associated specifically with sepsis among the general population. This impacts on patient survival, as early detection of the syndrome and rapid multimodal treatment consisting of fluid administration, rapid use of antibiotics, and cardiovascular and respiratory support is often significantly delayed.

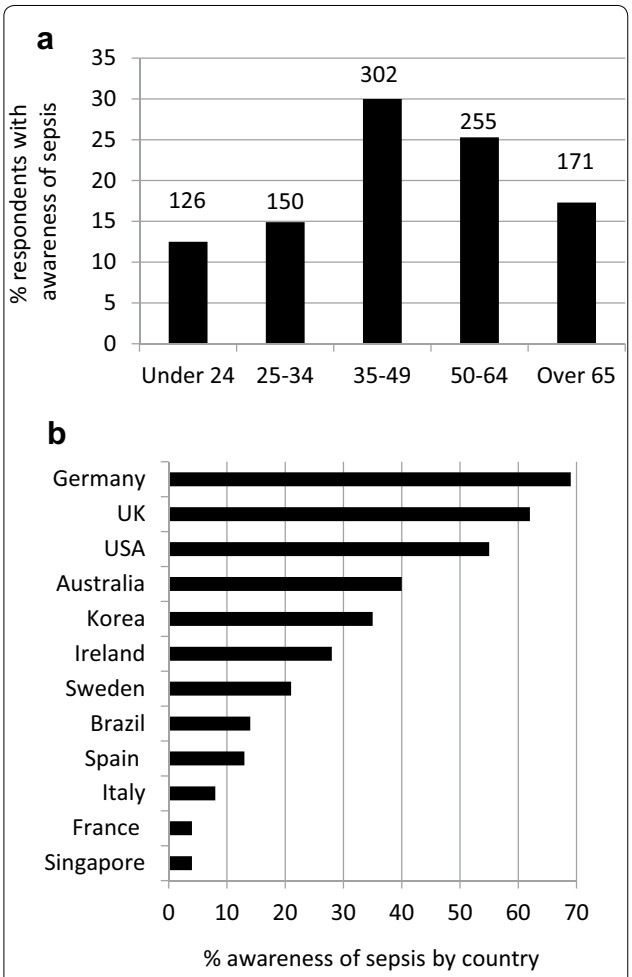


**Fig. 1** **a** The percentage and number of Irish respondents, by age category, who displayed awareness of sepsis. **b** Percentage of respondents who have displayed awareness of sepsis by country. The survey consisted of 1004 participants with no drop-out or missing data. Sources: Germany, UK, USA, Australia and Brazil—Reinhart et al., 2017; Korea—Park et al., 2014; Ireland—this study; Sweden—Melhammer et al., 2015; Spain, Italy and France—Rubulotta et al., 2009; Singapore—Phua et al., 2013

Our results suggest that the middle age group has the highest awareness of sepsis. It is surprising to see such a very low level of awareness among the younger group (under 24 years old). This is a worrying trend, as clearly not enough is being done in Ireland to target the younger generation, particularly in schools, sports clubs and social media. It is also surprising that there is less awareness in urban than in rural areas.

Unfortunately, sepsis had not been a priority for many healthcare authorities worldwide until spring 2017, when the World Health Organization (WHO) adopted a resolution on improving the prevention, diagnosis and management of sepsis [4]. This survey conducted in a relatively small country will allow us to track future sepsis awareness campaigns and to determine whether detection can be improved. Despite global initiatives to increase awareness, there are still only three countries that report awareness of sepsis above 50%, which include the USA, UK and Germany at 55, 62 and 69%, respectively (Fig. 1b). The variance in sepsis awareness between countries can most likely be attributed to high-profile and very successful performance targets tailored to local environments, such as "Rory's Regulations", which is gaining increased traction across the American states, the "Sepsis Kills" program in Australia, the "Just ask: 'could it be sepsis?'" campaign in the UK, and the multifaceted educational program in Brazil [4]. There is currently no discernable campaign in Ireland specifically targeted at increasing sepsis awareness in the community, and this likely accounts for the low numbers seen in this study. While work specifically with patient associations has triggered an interest on the part of the government and healthcare agencies to spot sepsis more rapidly, unfortunately, these campaigns have been developed only after the deaths of very young and otherwise healthy individuals [5]. Efforts are currently under way to create a robust Irish sepsis awareness campaign, adapted from the successful campaigns in the USA, UK and Australia, which aims to improve sepsis awareness in Ireland. As a first step, we recorded a documentary in collaboration with Ireland's national television broadcaster, RTE, aimed at promoting sepsis awareness. This was a successful effort, where 498,000 people watched the documentary. This was followed up with targeted posts on social media, mainly to under-24-year-olds, with banners listing signs and symptoms of sepsis and links to the "What Is Sepsis? (Sepsis Explained in 3 Minutes)" video from the Global Sepsis Alliance. We are currently organizing a national sepsis awareness campaign in schools and sports clubs targeted at teachers, coaches and athletes. Finally,

to strengthen the message, we are planning a number of exhibitions with information leaflets at public spaces such as hospitals, town squares and transport hubs to mark World Sepsis Day and make this a regular event in the Irish calendar.

In conclusion, in Ireland, public awareness of sepsis is unacceptably low. A plan to empower the public with critical information about spotting the signs and symptoms of sepsis is urgently needed in order to ensure earlier access to treatment, thus reducing the morbidity and mortality associated with this condition.

**Electronic supplementary material**
The online version of this article (https://doi.org/10.1007/s00134-018-5307-5) contains supplementary material, which is available to authorized users.

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**Acknowledgements**
The authors would like to acknowledge the Ciaran and Orlaith Staunton at the Rory Staunton Foundation for Sepsis Prevention for critical discussion and input. This publication was conducted with the financial support of Science Foundation Ireland (SFI) Grant Number 13/CDA/2119 (SWK).

**Compliance with ethical standards**

**Conflicts of interest**
The authors declare that they have no conflict of interest.

Received: 9 June 2018 Accepted: 6 July 2018
Published online: 19 July 2018

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