



Perspective

Cancer funding and Brexit

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The European Union (EU) is a leading body in research for many areas of medicine. Laws promoting the cooperation of various countries, each with their own set of skilled clinicians and research technology, are just the start. After the Brexit referendum result, British citizens will lose many of their rights to study and work within the EU, while EU citizens will struggle to keep Britain within their research fields. The generation of the future, today's youth, is anxious about the effect of Brexit on their academic and professional lives.

The European Union, commonly called the EU, is a political and economic union of 28 nations on the European continent. It was set up after the horrors of the Second World War, when nations agreed that becoming trade partners would make them more interdependent and therefore less likely to turn on each other. Although it started out with this purpose of peace, the EU has developed drastically over the past 50 years, and has led to nations cooperating with each other in ways that almost parallel the states of America. Citizens of the EU benefit from Freedom of Movement, which allows them to move freely across borders with no checks, and all nations are given access to the "single" or "internal" market – the trading market which covers the whole of the EU. The Euro is the common currency of 19 out of the 28 nations, the remainder of which chose to opt out of using it.¹ While many of the nations are happy to opt into all of these conditions, a few are given "special conditions". Britain is one of these nations. While its

citizens can freely move around the EU, any EU citizens moving into the UK are subject to border checks, and their currency is not the Euro but the Pound Sterling. Unfortunately, despite this special treatment, in a referendum held on 23rd June this year, Britain voted to leave the EU. This referendum was appropriately named the "Brexit" referendum, a combination of the words "Britain" and "Exit".

The EU's rules and regulations for research across the continent help to streamline research and allow for faster, more effective routes from the start of an application to the collection and use of the resulting data. It also provides framework for issues like the safety of any products created and/or released to the public and lays down the foundations for consumer and patient rights.

However, success in research is unfortunately not based solely on this "fast-track" advantage that the EU provides with its rules and future EU Portal/Database.² It is also a product of the effective funding schemes set up by the Union, as well as the opportunity presented to many scientists to collaborate with others in their field across the continent, therefore strengthening the approach that the scientific world has towards a problem by ensuring that it is viewed in a multitude of ways. In the final hours before the Brexit referendum, scientists and researchers nationwide voiced their concerns over the inevitable and heavy consequences that an independent Britain would have in their areas. A report published by Digital Science portrayed just how heavily the UK depends on funding from the EU for research, showing that if the UK fails to compensate for the loss in EU funds effectively, funding per year will decrease as much as £1bn across the UK research base.³ This is a startling figure, but when examined in detail the exact damage inflicted by the referendum is even more shocking.

The U.K. is the fifth largest world leader in the production and release of science and research journals, behind the USA, China, Japan and Germany, while slightly ahead of India and significantly ahead of France and Italy. Journals such as the British Medical Journal (BMJ) and The Lancet are based in the UK and respected worldwide. Of course EU funding isn't going to affect the efficiency of these journals directly, but it will indirectly affect both the quality and the quantity of the research that they can publish and spread worldwide. Without the collaboration of scientists via the Freedom of Movement act and the ease of data collection and analysis via the EU medical portals, gaining a strong foundation of medical news from the UK will become increasingly difficult for

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such journals, not to mention the restrictions that will eventually, inevitably be placed on their ability to publish Europe-wide. Such journals would be completely within their own right to move base to countries such as Germany, which will become by far the most funded EU country once Brexit is finalised. While the research conducted in the UK itself may not be affected by the loss of such medical journals, the ability of that research to make an impact and be developed on a global scale will be severely compromised.

The factors that will directly affect the efficiency and strength of the U.K. research base include the recession that appears to be on the horizon and the direct loss of funds from the EU towards research centres and fields within UK borders. While a recession is a nation-wide problem affecting more than just the research base, there is no doubt that it has devastating effects on research. In the 2008 recession, Cancer Research UK (CRUK) lost £76million in funding, demonstrating a need to make the UK research base more independent and self-sufficient rather than continuing to rely on funding directly from the government or EU. Over 40% of funding for studies concerning oncology and carcinogens is provided by the EU. By region, Scotland uses a significant portion of EU funding in their research, with about 60% of its research base relying on the EU.⁴ London has similar statistics, and as such both areas predictably voted for the Remain camp. 28 out of 33 London sectors and all of Scotland's authorities voted to remain, demonstrating a strong understanding by the people of the reliance these areas have on the EU. Cambridge and Oxford also have a strong dependence on the EU for research, with Cambridge and Oxford university receiving 20% and 23% of their funding respectively from the EU, and both areas also demonstrated a strong wish to remain with over 70% of voters in both areas voting for the remain camp.^{3,4}

The Brexit referendum was a historical moment for the UK, but whether or not it was a fair vote is still up for debate. The best indicator of how an area would vote was the proportion of residents that had a university degree, which in itself suggests how poorly informed the public was about the consequences of their vote.⁴ Another indicator was age, with over 70% of 18–25 year olds voting to remain while the older generations were more likely to vote leave. There seemed to be a large amount of patriotism and fear rippling the country throughout the month preceding the referendum, which clouded the view of many citizens when voting. Immigration was listed as one of the greatest concerns of the leave community, with the concern of Turkey joining the EU being a major issue discussed throughout both campaigns. The leave campaign itself started with real, solid arguments, but unfortunately later slipped into blatant racism and false promises to lure voters in. Many people believed that the NHS would be given almost all of the money that would normally go to the EU, a grand total of around £350 million a week, but in the days following the result Nigel Farage, one of the leading Leave campaign figures, was quick to point out that this was a suggestion not a promise and would not become a reality. So voters were duped twice – once by being told that immigrants were a major issue and burden on the NHS when in actual a large percentage of the NHS workforce consists of EU citizens, and a second time by being lead to believe

that funding towards the NHS would increase when this was never the case.

Healthcare and research in the UK is going to face severe consequences as a result of this vote, and the people deciding the future of the country were the people who would be affected the least. An old, largely uneducated population voted leave, and they're lucky. They don't have to worry about any of the many hurdles now facing future UK doctors and scientists, all they have to think of now is the joy of a once again "independent" Britain and the glory of guarding their country's "sovereignty". It's sad and unfortunate to see such an unrepresentative vote take place, and many have argued that it should never have taken place at all. The prime minister, David Cameron, resigned following the result, and is now being replaced by Theresa May. The economy plummeted overnight, with the pound reaching a 31 year low, and while markets are slowly recovering, no one is denying that the UK has entered a state of uncertainty, and many are fearful for the country's future. An online petition for a second referendum reached 4million signatures, the public was in an uproar on the morning of the result, and the 16–17 year old community protested in central London as they weren't given the right to vote on such an important decision. Overall, there is a consensus among the youth of the country that they were not heard, not represented, and not considered throughout the referendum. Now, while the older generations slowly disappear and we take their place, we will not have the opportunities they have had. We will not be able to freely move among EU member states to conduct our research, we will not be able to freely request and accept EU funding for our work, and we will not have the same rights and protection by law as many worker rights are regulated not by the UK, but by the EU. It seems to me that this situation was entirely unnecessary and the referendum should never have happened in the first place, but what I think doesn't matter. The vote did happen, and now we have to bear the consequences. I only hope, for my generations sake, that the government plugs the gap created in the scientific community, and that somehow the UK manages to keep its reputation as a leading research base worldwide.

Conflict of interest

The authors have declared that no competing interests exist.

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