

Geopolitical Changes and Trends in Middle Eastern Countries' Contributions to World Science over the Past Three Decades

It is an inconvenient truth that for many people tragedy, violence, and bloodshed are more attractive than routine daily peaceful life, hence the journalistic mantra “if it bleeds, it leads.” The Middle East, also known as “the cradle of civilization,” is usually called “the cross-roads of the world” and appears prominently in the media for its long-lasting geopolitical turmoil. Consequently, images of bloodshed dominate the Western imagination of the region. These changes, however, have seriously affected science production so that one cannot study the science growth of the region without considering its geopolitical changes.

Despite a nearly constant tension over the past three decades in the Middle East, science production of the region has grown nearly four times faster than the world's pace.¹⁻⁴ The growth, nonetheless, has been very uneven across Middle Eastern countries (Figure 1). There are several countries with fast growth, the most prominent of which are Iran and Turkey, with growth rates of 11 and 5.5 times faster than the mean growth in world science production, respectively (Figure 1).^{1,2,4} Other fast-growing countries include Cyprus, Oman, and the United Arab Emirates (UAE). Contribution to science by Kuwait, Bahrain, and Egypt has been constant over the said period while the growth of Saudi Arabia, Israel, and Iraq has been lower than that observed at the world level.^{1,2}

Soon after its revolution, Iran faced one of the bloodiest wars to occur after World War II; in 1980, Iraq invaded Iran and began a war that lasted for eight years. During the conflict, Iraq was supported by many countries. Two of the staunchest financial supporters of Iraq were the two oil-rich Persian Gulf states, Kuwait, and Saudi Arabia. However, Kuwait was invaded by Iraq in 1990; but the war was soon waged by a US-led coalition force from 34 nations with resultant freedom of Kuwait in 1991. Then, the UN Security Council adopted a Resolution which imposed a full trade embargo on Iraq. This sustained economic sanction was effective until 2003 when Iraq was invaded by a combined force of troops from the US, the UK and few other countries with resultant toppling of the Iraq regime.

With its constant tensions, it is not unexpected that Iraq has the region's worst performance in science production. Israel, which also has had persistent military actions during the past 30 years could not invest much on research, hence its low performance in science production. Kuwait had a sharp decline in its science production soon after it was invaded by Iraq.^{1,5} However, considering that there is usually a lag between change in research activity and publication output, the financial support of \$8.2 billion for Iraq in

its war against Iran might have hampered research activities in Kuwait as well. The same may have happened to Saudi Arabia which also supported Iraq in its war against Iran with \$30.9 billion.

Turkey had a good incentive for rapid growth. Although many European countries are still relatively reluctant to welcome Turkey into the European Union, the Turkish government is very keen to join the European fold and probably, that is one of the major forces which has increased its investment on research almost six-fold between 1995 and 2007.²

Based on a recent report published by the Royal Society of the UK, “Iran has the fastest rate of increase in scientific publication in the world.”^{2,3} Among the studied countries, Iran is unique in terms of its regime and policy changes. In the 1980s, almost immediately after the revolution, Iran experienced a decline in science production for several reasons which included war, embargo, and emigration of numerous skilled scholars.^{6,7} In the 1990s, in the aftermath of the imposed Iraq-Iran war, Iran found itself with numerous war casualties many of whom had been afflicted by chemical warfare, and lack of a commensurate health care system. To tackle these problems, the system was re-organized. The national budget was first redirected to education sectors with resultant increase in the number of graduates and professors who needed to publish articles to graduate and career promotion, respectively.⁸ After developing the necessary infrastructure for research, Iran has allocated a larger budget to its research sector.² Some researchers believe that the astronomical scientific growth of Iran—mostly in medicine, agriculture, and nuclear technology—may have been a reaction of Iranian scholars and government to its isolation.^{1,4} Although the number of research articles published from Iran in collaboration with other countries has increased significantly, the proportion of papers produced in collaboration with other countries decreased from more than 35% in 1996 to less than 20% in 2008.^{2,9}

Another point to mention is that despite the rise in numbers of published articles from the Middle East, the quality of published articles is not yet comparable to those published from the US and Europe. Currently, five of ten high impact journals originate from the US, three from Europe and two from other regions.¹⁰ However, that is not unexpected as in most enterprises, normally quality comes after quantity.¹¹

We are happy to hear this good news which means that the Middle East may have a brilliant future for regaining its fame and be recognized again for its science production, rather than its turmoil, providing that the member countries can use the knowledge being

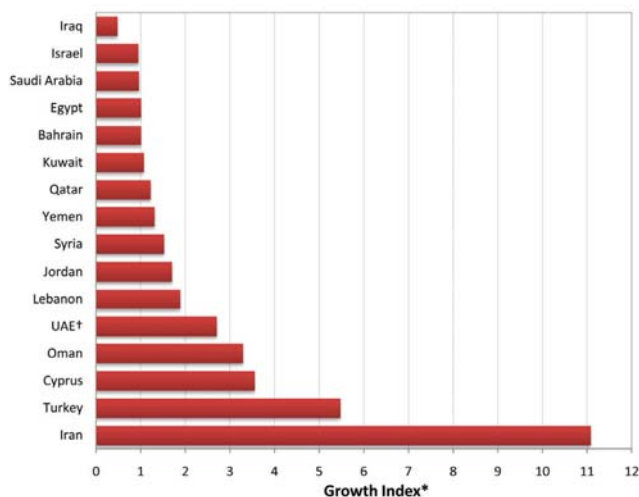


Figure 1. Growth in the contribution of Middle Eastern countries to world science from 1995 – 2009 compared to 1980 – 1994.

*The growth index for each country is calculated by dividing its “contribution to world science in 1995 – 2009” by its “contribution to world science in 1980 – 1994” based on the Web of Science (Thomson Reuters).¹ The mean growth in world science production is 1. †United Arab Emirates.

produced astutely to improve the region’s quality of life. Meanwhile, greater emphasis is necessary to ensure better education, conduction of research and production of quality articles. We should also be alert to prevent and control what threatens this progress, one of the most important being scientific misconduct and plagiarism.^{12–15} Therefore, whistleblowers should come into being to keep an eye on scientific misconducts which normally surface as the numbers of articles increase.

Conflicts of Interest: I am Iranian.

Financial Support: None.

Farrokh Habibzadeh MD, Director, NIOC Medical Education and Research Center, Shiraz, Iran.

E-mail: Farrokh.Habibzadeh@theijoem.com

References

1. Archambault E. 30 years in science: Secular movements in knowledge creation. Available from: URL: www.science-metrix.com/30years-Paper.pdf (Accessed, March 25, 2011).
2. Knowledge, networks and nations: Global scientific collaboration in the 21st century. London: The Royal Society, 2011. Available from: URL: http://royalsociety.org/uploadedFiles/Royal_Society_Content/Influencing_Policy/Reports/2011-03-28-Knowledge-networks-nations.pdf (Accessed, April 5, 2011).
3. Coghlan A. Iran is top of the world in science growth. Available from: URL: www.newscientist.com/article/dn20291-iran-is-top-of-the-world-in-science-growth.html. New Scientist. March 28, 2011 (Accessed, April 5, 2011).
4. MacKenzie D. Iran showing fastest scientific growth of any country. Available from: URL: www.newscientist.com/article/dn18546-iran-showing-fastest-scientific-growth-of-any-country.html. New Scientist. February 18, 2010 (Accessed, March 28, 2011).
5. Tadmouri GO, Bissar-Tadmouri N. Biomedical publications in an unstable region: the Arab world, 1988 – 2002. *Lancet*. 2003; **362**: 1766.
6. Habibi G, Rashidi A, Feldman MD. Emerging concerns about Iran’s scientific and medical future. *Lancet*. 2006; **368**: 985.
7. Habibzadeh F, Vessal K. Scientific research in Iran: Forgotten factors. *Lancet*. 2006; **368**: 1494.
8. Habibzadeh F. A bird’s eye view of science publishing and editing in Iran. *Eur Sci Edit*. 2006; **32**: 98 – 100.
9. Coghlan A. Iran is top of the world in science growth. Available from: URL: www.newscientist.com/article/dn20291-iran-is-top-of-the-world-in-science-growth.html. New Scientist. March 28, 2011 (Accessed, April 5, 2011).
10. Karlberg JPE. Biomedical publication trends by geographic area. *Clinical Trial Magnifier*. 2009; **2**: 682 – 701.
11. Shukman D. China ‘to overtake US on science’ in two years. Available from: URL: www.bbc.co.uk/news/science-environment-12885271. BBC News, March 28, 2011 (Accessed, April 5, 2011).
12. Ferris LE, Fletcher RH. Conflict of interest in peer reviewed medical journals: The World Association of Medical Editors (WAME) position on a challenging problem. *Int J Occup Environ Med*. 2010; **1**: 55 – 59. Available from: URL: www.theijoem.com/ijoem/index.php/ijoem/article/view/22/54. (Accessed, April 5, 2011).
13. Lang TA. The illusion of certainty and the certainty of illusion: a caution when reading scientific articles. *Int J Occup Environ Med*. 2011; **2**: 118 – 123. Available from: URL: www.theijoem.com/ijoem/index.php/ijoem/article/view/82/165 (Accessed, April 5, 2011).
14. Habibzadeh F, Marcovitch H. Plagiarism: the emperor’s new clothes. *Eur Sci Edit*. 2011; **37**: 67 – 69.
15. Habibzadeh F, Shashok K. Plagiarism in scientific writing: words or ideas? *Croat Med J*. 2011; **52**: 576-577.