

Biomedical publications in an unstable region: the Arab world, 1988–2002

Sir—The geographical origin of biomedical publications has become the subject of detailed research.^{1,2} We aimed to investigate the number of MEDLINE-indexed publications in Arab countries, normalised to population size or gross domestic product (GDP).

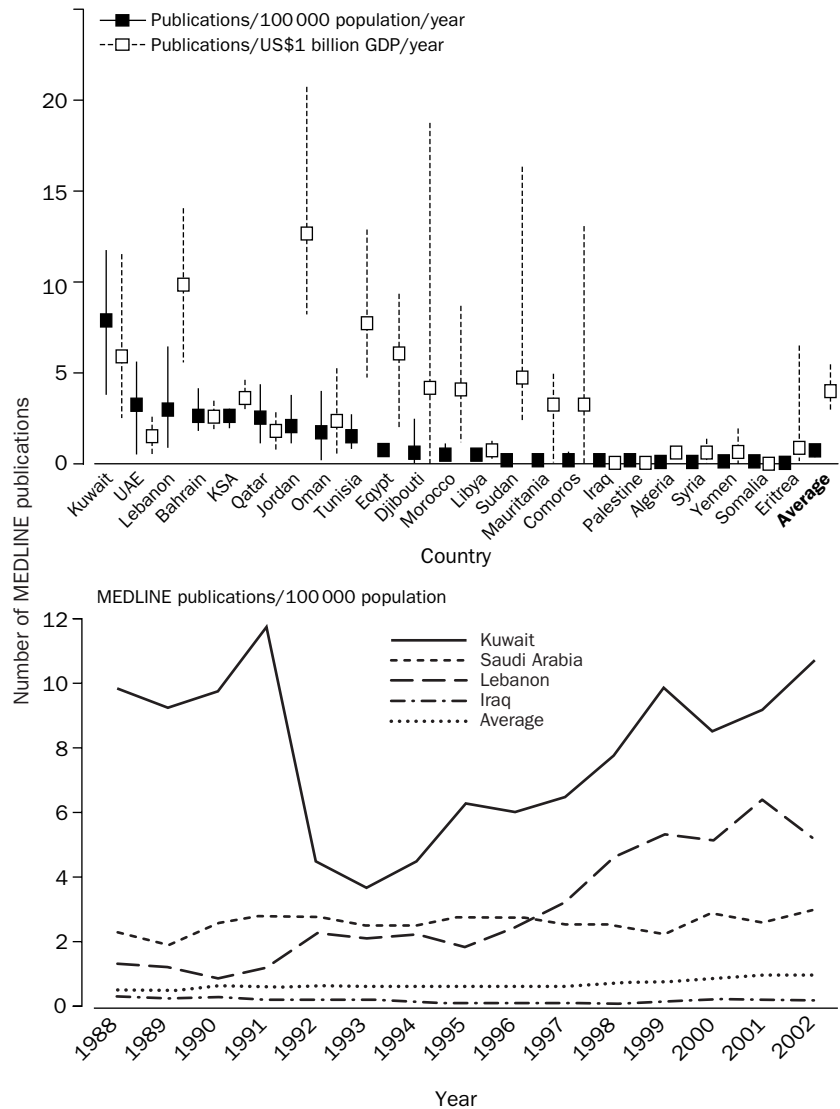
We directed sensitive search strategies³ to MEDLINE within a single hour, and collected data for 1988–2002 in “MEDLINE format” text files. These files were converted to a local analysis system by means of a Visual Basic program written for this purpose. Historical population and GDP data were obtained from the US Census Bureau (<http://www.census.gov/ipc/www/idbacc.html>) and EconStats (<http://econstats.com>), respectively.

We found that Arabs produce less than 1% of the biomedical citations in the world, despite the available wealth and human resources. MEDLINE results normalised to population size show that small countries such as Kuwait, the United Arab Emirates, and Lebanon are more productive than Egypt and Saudi Arabia—the largest publishers in the Arab world (figure, top).

Military spending by Arabs amounts to about US\$60 billion of the \$600 billion GDP per year, whereas only \$0.9 billion is allocated to research and development.⁴ However, Arab countries still produce significant numbers of MEDLINE publications per \$1 billion GDP per year when compared with countries in the European Community.² By this analysis, Jordan is equivalent to the UK, and Lebanon equivalent to Italy or France. However, biomedical research in the Arab world focuses mainly on the relatively cheap curative services rather than more expensive research and development such as molecular genetics.⁵ Additionally, extended collaborations, mostly with the European Community or the USA, reduce the costs of expensive research in the Arab world.³

We suggest that GDP-normalised bibliometric data can be misleading and should be used carefully in the analysis of biomedical research output in developing countries.

Since the 1950s, Arabs have made little progress in health-related areas for several reasons: the Arab-Israeli conflict, the catastrophic health and economic situation in Palestine and Somalia, the embargoes on Iraq and Libya, and the



MEDLINE publications normalised to population and GDP data for Arab countries, 1988–2002

Boxes=means, vertical lines=range. GDP=gross domestic product, UAE=United Arab Emirates, KSA=Kingdom of Saudi Arabia.

major wars that erupted in the past few decades, mainly in Lebanon (1975–91), Kuwait (1990), and Iraq (1980–88, 1991, and 2003). Annual MEDLINE publication data, normalised for population size, for some Arab countries reflect the instability of the region (figure, bottom). In Kuwait, a sharp drop in publications was seen in 1992, followed by a gradual rise starting from 1993 after the Iraqi invasion and the liberation war. The same type of rise was seen for Lebanon after the end of the Lebanese war in 1992. In Iraq, however, a negligible output of biomedical research has been seen because of the consecutive wars in which Iraq was involved in the past 25 years and the dedication of the GDP budget to military spending. In Saudi Arabia, the unvarying publication trend is due to the economic burdens caused by the

consecutive Gulf wars. We conclude that regional conflicts have been major reasons for the deterioration of biomedical output in the Arab world.

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- 1 Thompson DF. Geography of U.S. biomedical publications, 1990 to 1997. *N Engl J Med* 1999; **340**: 817–18.
- 2 Hefler L, Tempfer C, Kainz C. Geography of biomedical publications in the European Union, 1990–98. *Lancet* 1999; **353**: 1856.
- 3 Tadmouri GO, Bissar-Tadmouri N. A major pitfall in the search strategy on PubMed. *Saudi Med J* (in press).
- 4 Masood E. Arab science: blooms in the desert. *Nature* 2002; **416**: 120–22.
- 5 Tadmouri GO, Tadmouri NB. Biomedical research in the Kingdom of Saudi Arabia (1982–2000). *Saudi Med J* 2002; **23**: 20–24.