LETTER TO THE EDITOR

Qatar biomedical and cancer publications in PubMed between 2000 and 2012
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ABSTRACT

Background: The aim of this work was to analyse the past trends of biomedical and cancer publications from Qatar listed on PubMed for the years 2000 – 2012. These findings were then compared with the corresponding global number of publications.

Methods: PubMed was searched for cancer publications, clinical trials, publications on humans or other species. Searching for "Qatar*" in the "Affiliation" field yielded the lowest number of publications; searching for "Qatar*" in the "Title/Abstract" or "Text Word" fields yielded the highest number of publications. The annual percentage change (APC) from one year to the next was calculated for the population and each type of publication. Information on the population of Qatar was gathered from the website of Qatar Statistics Authority to determine the correlation of papers published per 1000 population.

Results: The number of publications retrieved from PubMed was not particularly different for each variation of search carried out. However, the most representative number of publications was retrieved upon searching for "Qatar*" in the "Affiliation" or in "Title/Abstract" fields. Between the years 2000 and 2012, the total number of biomedical publications from Qatar increased 24 times with an average APC of 33.4%, which was found to be more than the APC of the population in Qatar which averaged at 9%. The number of biomedical publications per 1000 population increased from 0.02 in 2000 to 0.15% in 2012. Most publications retrieved were humans studies and occasionally were for other animal species. Cancer publications in Qatar represented 16.9% of the total publications and the number of cancer publications per 1000 population increased from 0% in 2000 to 0.02% in 2012. Publications classified as

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clinical trials represented 4.6% of Qatar biomedical publications. Publication of cancer clinical trials were very rare (0.4%).

Conclusions: Despite the obvious increase in Qatar biomedical and cancer publications in PubMed, the absolute numbers were relatively small. While strategies are in place, leaders of Qatar biomedical research need to consider increasing cancer research and clinical trials to meet the country’s needs. Linking research output to researchers, research facilities and research funding is needed.

Keywords: Qatar, PubMed, biomedical research, cancer research

INTRODUCTION

The Qatar National Vision aims at transforming the country by 2030 to become an advanced society capable of sustaining its own development and providing a high standard of living for all of its people for generations to come. Major advances in economic, human and social developments continue to occur in Qatar. Important initiatives that will propel Qatar to become a fully developed nationhood, and strengthen its role in the international community are continually implemented. (1) Qatar is ranked at the top of the list for health expenditure per capita among the Gulf Cooperative Council (GCC). (2) It spends 1.9% of global domestic product (GDP) on health and life expectancy in Qatar is currently 78 years. (3) The country’s abundant wealth creates both previously undreamt of opportunities and formidable challenges. (1) Almost 30% of Qatar’s youth and 16% of adults are current tobacco users. (4) Among adults, diabetes afflicts 12.4% of males and 11% of females while hypertension afflicts 34.4% of males and 27.6% of females. Almost 31% of adult males and 39% of adult females are obese. (5) Cancer is an important public health problem in Qatar with an incidence rate among males and females of 51 and 87 cases per 100,000 population, respectively. Lung cancer was the most frequent cancer diagnosed in men and breast cancer was the most frequent in women. The incidence rate of breast cancer in Qatar was very high compared to other Middle Eastern countries. (6) These health problems make it necessary for increased research in these fields.

Qatar is heavily investing in research. In 2006, Qatar National Research Fund (QNRF) was established to foster original, competitively selected research in engineering and technology, physical and life sciences, medicine, humanities, social sciences and the arts. (7) Qatar has founded many research facilities and institutions for example Qatar Biomedical Research Institute (QBRI) a member of Qatar Foundation which set up several research centers (Diabetes Research Center, Cancer Research Center, Genetics Diseases Research Center, Stem Cell and Regenerative Medicine Research Center, Genomic Medicine and Systems Biology Research Center, Gene-based Therapy Research Center, Biomedical Engineering Research Center and the Qatar Biobank). (8) Among the six GCC countries, Qatar is only second to Kuwait in the number of publications when normalised to population size with its relatively high output of publications. (9)

The aim of this work was to analyse the past trends of biomedical and cancer publications from Qatar listed on PubMed for the years 2000 – 2012. These findings were then compared with the corresponding global number of publications. The findings are intended to help policymakers identify areas that need more attention to achieve the desired national research goals.

METHODS

On December 10 – 11, 2013, PubMed was searched for biomedical publications from Qatar and globally. (10) In the search builder, "publication dates" between the years 2000 and 2012 were queried. This yielded the total biomedical publications worldwide. Different filters were then applied that included "Article types: clinical trial", and "Subjects: cancer". This gave the corresponding numbers of publications for the relevant section.
A new search was then performed for the word (Qatar*) in different locations within the publication. (1) Searching in the "Affiliation" field produced the lowest number of publications which we referred to as the lowest estimate (LE). (2) Searching "Affiliation" OR "Title/Abstract" yielded a moderate number of publications; moderate estimate (ME). (3) Searching "Affiliation" OR "Title/Abstract" OR "Text Word" yielded the highest number of publications; high estimate (HE). The affiliations, titles and abstracts of all the retrieved publications were visually inspected to ensure that the search word was contained in the desired location. For the first search, the word "Qatar*" was present in the affiliations of 100 percent of the retrieved publications. Similarly for the second search, the word "Qatar*" was present in the affiliations or title or abstract of 100 percent of the retrieved publications. For the third search and due to the limited access to full-text, the word "Qatar*" could not be verified in all of the publications. However, we could verify that it was present in the Medical Subject Heading (MeSH) terms of 100 percent of the retrieved publications. Titles, affiliations and abstracts and MeSH terms of the retrieved publications were reviewed.

The three search types produced Qatar’s total number of biomedical publications (QTBP). Then, the search field "Date-Publication, 2000 to 2000 through 2012 to 2012" was used. This gave QTBP during the years 2000 through 2012. Different filters were then applied that included "Article types: clinical trial", "Species: Humans and Other Animals", and "Subjects: Cancer".

To calculate the number of publications per 1000 population, data on the Qatar population was retrieved form the Qatar Statistics Authority(11).
and data on the world’s population was retrieved from The United States Census Bureau.[12] For populations and publications, the annual percentage change (APC) was calculated by dividing a relevant number in one year by that of the preceding year and multiplying the output by 100. Microsoft Excel® 2010 was used for calculations and plotting of figures.

RESULTS

For different types of publications, no major difference was observed in the search results between the moderate estimate (ME) and the highest estimate (HE) of publications and both curves were found to be almost overlapping in Figure 1. The lowest estimate (LE) is clearly separated from both ME and HE, despite only a small amount. Based on the review of the retrieved publications, the moderate estimate was found to provide the best estimate of publications. Hence, it was the one used in further analyses and comparisons.

Between 2000 and 2012, the total biomedical publications (TBP) from Qatar and worldwide, increased progressively. For Qatar, the numbers of TBP increased almost 24 times with an average percentage change (APC) of 33.5% and cancer publications increased almost 13 times with an average APC of 27.7% (Table 1; Figure 2). Globally, TBP doubled during the same period with an APC of 5.6% and cancer publications doubled with an average APC of 5.8% (Table 1; Figure 3). During the same period, the population in Qatar almost tripled with an average APC of 9% while the world’s population increased by 15% with an average APC of 1.17% (Table 1; Figure 4). For both Qatar and the rest of the world, the APC of publications exceeded the APC of the population. The average APC of Qatar TBP was 3.7 times the APC of its population and globally the same figure was 4.8 times.

The number of publications increased with time. The number of TBP in Qatar per 1000 population increased progressively from 0.02 to 0.15% with an average of 0.08%. This was lower than the corresponding figures for the rest of the world (Table 1; Figure 5). The number of cancer publications also increased from 0 to 0.02% with an average of 0.01%. Again, this was below the corresponding figures for the rest of the world (Table 1; Figure 6). Most Qatar biomedical publications were reported on humans and occasionally on animals with a human to animal ratio of approximately 12:1.
Table 2. Comparison of cancer publications, clinical trial publications and cancer clinical trial publications between Qatar and The Whole World.

| Year | World (W) | Qatar (Q) | % WTB | WCT | % WTB | QTB | QC | % QT B |
|------|-----------|-----------|-------|-----|-------|-----|----|--------|
| 2000 | 529,665   | 24,569    | 4.64  | 12  | 1     | 8.3 | 122,919 | 23.2 | 3    |
| 2001 | 544,385   | 23,691    | 4.35  | 32  | 1     | 3.1 | 126,771 | 23.3 | 5    |
| 2002 | 561,636   | 24,636    | 4.39  | 25  | 0     | 0   | 131,661 | 23.4 | 5    |
| 2003 | 592,052   | 28,538    | 4.82  | 36  | 0     | 0   | 140,168 | 23.7 | 9    |
| 2004 | 636,944   | 31,843    | 5.00  | 63  | 4     | 6.4 | 149,897 | 23.5 | 10   |
| 2005 | 698,514   | 35,689    | 5.11  | 80  | 4     | 5.0 | 162,193 | 23.2 | 15   |
| 2006 | 743,972   | 36,339    | 4.88  | 82  | 5     | 6.1 | 171,708 | 23.1 | 12   |
| 2007 | 781,617   | 38,689    | 4.95  | 94  | 3     | 3.1 | 182,660 | 23.4 | 15   |
| 2008 | 830,870   | 39,040    | 4.70  | 110 | 6     | 5.5 | 194,007 | 23.3 | 13   |
| 2009 | 870,801   | 39,776    | 4.57  | 140 | 4     | 2.9 | 203,469 | 23.4 | 26   |
| 2010 | 933,137   | 41,414    | 4.44  | 197 | 12    | 6.1 | 220,096 | 23.6 | 28   |
| 2011 | 1,006,230 | 46,518    | 4.62  | 213 | 15    | 7.0 | 238,107 | 23.7 | 24   |
| 2012 | 1,063,576 | 47,904    | 4.50  | 284 | 15    | 5.3 | 250,655 | 23.6 | 40   |
| Total | 9,793,399 | 458,646   |       | 1,368| 70  | 0   | 2,294,311 | 205  | 119,336 |
| Average | 753,338 | 35,280    |       | 105 | 5    | 5   | 176,485 | 23   | 16   |

Q: Qatar; W: World; C: cancer; CT: clinical trials; CCT: cancer clinical trials; TB: total biomedical; %TB: percentage of total biomedical publications.
Publications reporting on humans showed the same pattern of increase with time similar to the total biomedical publications.

Between the years 2000 and 2012, almost 23% of the world’s publications focused on cancer, 5% reported on clinical trials and 1.2% reported on cancer clinical trials. For Qatar, almost 17% of publications focused on cancer, 5% reported on clinical trials and only 0.4% reported on cancer clinical trials (Table 2; Figure 7). The global data collected was found to be quite stable and that for Qatar was clearly fluctuating.

DISCUSSION

There were obvious increases in Qatar biomedical and cancer publications in PubMed. We confirmed the earlier finding by Al-Maawali and colleagues that biochemical research is notably increasing in Qatar. (9) Additionally, we provided new analyses according to the type of publication and compared our findings to global figures that represent the world’s average. However, the absolute publication numbers are still relatively small. The number of publications per 1000 population is small and lies below global figures. The contribution of research organizations and institutes e.g., QNRF and QBRI to the increased biomedical publications cannot be denied.

Cancer publications constitute about 17% of Qatar biomedical publications which is below the global average of approximately 24%. The cancer age-standardized incidence and mortality rates in Qatar are almost 60% and 68% of the world’s figures, respectively. (13) In Qatar, cancer is fourth among the top 10 mortality causes following cardiovascular diseases, road–traffic accidents and diabetes. (14) To significantly reduce the burden of cancer and to strive to provide cancer care at a standard of excellence, the five-year Qatar National Cancer Strategy (NCS) was launched in 2011 with 62 recommendations falling into 9 categories including cancer research. (15) In the current studies, cancer publications is markedly increased since the year 2009 and this may reflect a favorable outcome of the NCS.

Similar to the rest of the world, publication of clinical trials from Qatar represented a small proportion (5%) of the total biomedical publications. Compared to the millions of publications worldwide, clinical trials in trial registries are only a few–hundred thousand in number. For example, clinicaltrials.gov and the International Clinical Trials Registry Platform (ICTRP) contain 163,090 and 229,638 records as of March 2014 (www.clinicaltrials.gov ICTRP). Many factors contribute to the scarcity of clinical trials e.g., time and financial demands; shortage of specialists and researchers; increasing complexity of regulations and contracts; lack of supportive infrastructure; inadequate research training; less enjoyment from participation; and data collection challenges. (16) Publication of cancer clinical trials from Qatar were very few in number (~1%). The registry of clinicaltrials.gov contains 48 trials from Qatar and 11 of them are cancer related.

Leaders in research in Qatar have set long–term plans to increase biomedical research in general and cancer research in particular. However, the absolute numbers are still small and may be lower than what is expected for the distinguished setup and facilities. Periodic assessment of the outcome of the pre-set strategies is warranted to fine–tune the strategies to yield the maximum output. Special emphasis on cancer research is needed particularly with ageing of the Qatar population and the expected increase in cancer incidence. Clinical trials also deserve special attention. More analyses that link Qatar research output to researchers, research facilities and funding is needed.

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REFERENCES

1. Qatar General Secretariat for Development planning. Qatar National Development Strategy 2011 – 2016: Towards Qatar National Vision 2030. Doha: [online]. available at: http://www.qu.edu.qa/pharmacy/components/upcoming_events_material/Qatar_Nat_Development_Strat_EN.pdf (accessed May 8, 2014) Gulf Publishing and Printing; 2011.

2. Allianz Worldwide Care. Healthcare in Qatar [online]. 2008. available at: http://www.allianzworldwidecare.com/healthcare-in-qatar (accessed May 8, 2014).

3. Central Intelligence agency. The World Factbook: Qatar [online]. 2014. available at: https://www.cia.gov/library/publications/the-world-factbook/geos/qa.html (accessed May 8, 2014).

4. World Health Organization. WHO Report on the Global Tobacco Epidemic, 2013: Qatar [online]. 2013. available at: http://www.who.int/tobacco/surveillance/policy/country_profile/qat.pdf?ua=1 (accessed May 8, 2014).

5. World Health Organization. Qatar: health profile [online]. 2013. available at: http://www.who.int/gho/countries/qa.pdf (accessed May 8, 2014).

6. Bener A, Ayub H, Kakil R, Ibrahim W. Patterns of cancer incidence among the population of Qatar: a worldwide comparative study. Asian Pac J Cancer Prev. 2008;9(1):19 – 24.

7. Qatar Foundation. Qatar National Research Fund (QNRF): about QNRF [online]. 2008. available at http://www.qnrf.org/about_qnrf/ (accessed May 8, 2014).

8. Qatar Foundation. Qatar Biomedical Research Institute (QBRI): about QBRI [online]. 2013. available at http://www.qbri.org.qa/about (accessed May 8, 2014).

9. Al–Maawali A, Al Busadi A, Al–Adawi S. Biomedical publications profile and trends in Gulf cooperation council countries. Sultan Qaboos Univ Med J. 2012;12(1):41 – 47.

10. National Center for Biotechnology Information. PubMed [online]. available at: http://www.ncbi.nlm.nih.gov/pubmed (accessed December 10 – 11, 2013).

11. Qatar Statistics Authority. Population [online]. 2013. available at: http://www.qsa.gov.qa/eng/periodical/annals/2012/1_Population2012.pdf (accessed August 24, 2013).

12. The United States Census Bureau. International Programs [online]. 2013. available at: http://www.census.gov/population/international/data/idb/worldpoptotal.php (accessed December 10, 2013).

13. International Agency for Research on Cancer. GLOBOCAN 2012: Estimated Cancer Incidence, Mortality and Prevalence Worldwide in 2012 (Qatar and World) [online]. 2014. Available at: http://globocan.iarc.fr/old/summary_table_pop-html.asp?selection=160634&selection=224900&title=Qatar%2C+World&sex=0&type=0&window=1&sort=0&submit=%C2%A0Execute (accessed May 8, 2014).

14. World Health Organization. Health System Observatory: Qatar [online]. 2003. available at: (http://gis.emro.who.int/HealthSystemObservatory/PDF/Qatar/Health%20status%20and%20demographics.pdf (accessed May 8, 2014).

15. Qatar Supreme Council of Health. National Cancer Strategy, 2011 [online]. 2011. available at: http://www.nhsq.info/strategy-goal-and-projects/national-cancer-strategy (accessed May 8, 2014).

16. Institute of Medicine (US) Forum on Drug Discovery, Development, and Translation. Transforming Clinical Research in the United States: Challenges and Opportunities: Workshop Summary. Washington (DC): [online]. available at: http://www.ncbi.nlm.nih.gov/books/_NBK50888/ (accessed May 8, 2014) National Academies Press (US); 2010.