

Online sources of health statistics in Saudi Arabia

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ABSTRACT

قد يواجه الباحثون عن الإحصائيات الصحية في المملكة العربية السعودية بعض الصعوبة في العثور عليها، وأحد أسباب هذه المشكلة يكمن في عدم معرفة المصادر التي توفر هذه الإحصائيات وعدم معرفة الطريقة المثلى للبحث فيها. يهدف هذا المقال إلى تلخيص أهم المصادر المتوفرة على الإنترنت والتي يمكن أن يجد فيها الباحثون الإحصائيات الصحية في السعودية، واستعراضها من حيث المحتوى والتغطية وطريقة عرض الإحصائيات. لقد تم استعراض 5 من قواعد البيانات التي تحتوي على مجالات البحوث المحلية، بالإضافة إلى ذلك تم استعراض التالي: السجلات الوطنية الخاصة بالأمراض، والجهات الحكومية والجمعيات والمراكز التي يتوافر فيها قدر كبير من الإحصائيات الصحية. وأخيراً تم استعراض بعض المصادر الدولية التي قد يجد فيها الباحث الإحصائيات المحلية أو إحصائيات الدول الأخرى بغرض عمل مقارنة فيما بينهما.

Researchers looking for health statistics on the Kingdom of Saudi Arabia (KSA) may face difficulty. This is partly due to the lack of awareness of potential sources where such statistics can be found. The purpose of this paper is to review various online sources of health statistics on KSA, and to highlight their content, coverage, and presentation of health statistics. Five bibliographic databases where local research can be found are described. National registries available are summarized. Governmental agencies, as well as societies and centers where the bulk of health statistics is produced are also described. Finally, some potential international sources that can be used for the purpose of comparison are presented.

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Health statistics are important for knowing the health status of the whole population and its various segments and groups, as well as the trend in health status, the provision and distribution of healthcare services, and the impact of the provided services and programs. The success or failure of healthcare programs cannot be verified without properly collected and interpreted health statistics. Proper allocation of resources also depends on health statistics. Researchers, presenters, and health care workers and students always need health statistics. However, it is not uncommon to find a local article or presentation, which reports health statistics from all over the world, but fail to report local statistics from the Kingdom of Saudi Arabia (KSA). The justification we always hear is the lack of local statistics. Although this is true in some cases, it is not for many others. Lack of awareness of availability of such data, and how to search for them is a common reason, especially among medical students and new graduates. We hope that this paper will provide useful contribution in this issue. The purpose of this paper is to give an overview of the most important sources of health statistics of KSA, highlight their useful features and limitations, and give some tips on the best way to search in these sources. We will start with a brief introduction on various methods through which health statistics are generated.

How are health statistics produced? Health statistics are generated using various methods including surveillance, surveys, vital statistics, and disease registries. Surveillance is based on counting individual health-related events among people who came in contact with health services providers. Thus, surveillance data may not be representative of the whole population since it is confined to people who seek healthcare. Still, these data are useful in evaluating general health status and effect of health services. Health surveys are becoming more widely used in the current years and can be a rich source of health statistics. Surveys are conducted using different methods, and readers need to examine the methodology carefully before accepting the conclusions, or generalizing the results. Health statistics among military personnel are not expected to be similar to the general population, and surveys based on a sample of hospital patients are not generalizable to

the whole population. Vital statistics are concerned with the recording of birth and death events and associated conditions, and are required by law. Data are recorded initially by physicians, and then reported by hospitals. An overview of vital statistics is included in the Ministry of Health (MOH) annual report discussed below. Registry is the system of registration. Register refers to “the file of data concerning all cases of a particular disease or other health-relevant condition in a defined population, such that the cases can be related to a population base”.¹ Registries enable researchers to calculate incidence and prevalence (in populations covered by the registry), as well as other parameters of diseases. Registries are also a good source to identify subjects for research especially for rare diseases. Like surveillance, data in registries are affected by case definition. Change of case definition over the years will affect the interpretation of time trends.

Sources of health statistics. The following categories summarize potential sources of health statistics that can be used to find statistics of KSA: bibliographic databases, governmental agencies, societies, associations and centers, registries, and international resources. Here, a brief description and some examples are given for each category.

1. Bibliographic databases. Health statistics are sometimes reported in journal articles or conference proceedings, such as surveys and studies on the prevalence of diseases. This form of publications can be reached and searched through bibliographic databases like MEDLINE database. The following sections describe some databases that can be used to find publications on KSA. Table 1 summarizes journals published in KSA and their indexing status in various bibliographic databases.

a) Pubmed. Pubmed, the web interface for MEDLINE database is the most widely used database among health professionals. Being a huge database with more than 19 million citations, users need to utilize search strategies and filters suitable for their purposes. To look for health statistics, searchers need to combine a filter for the country, as well as for the type of studies expected to have health statistics information. Using the term (“Saudi Arabia”[mesh] OR Saudi[tiab]) may fit the purpose in this setting. Similarly, using (prevalence[mesh] OR prevalence[ti]) is likely to retrieve relevant articles presenting prevalence data. Obviously, researchers intending to conduct comprehensive search for systematic reviews, or similar purposes should use more sensitive search strategies. For example, using affiliation tag for the country (Saudi[ad]) is much more sensitive.

b) Index Medicus for the Eastern Mediterranean Region (IMEMR). The IMEMR was launched in 1987

by the World Health Organization (WHO) Regional Office for the Eastern Mediterranean (EMRO) to index health and biomedical journals published in the region.² The rationale was that most journals in the region are not indexed in international literature databases, while they publish studies and data originating from the region. Hence, having them indexed in one local database will help researchers find research information on the countries in the region, and improve visibility of the journals to international readers. The IMEMR is currently indexing 470 journals and includes more than 100,000 records.² Using the same medical subject headings used in the MEDLINE database makes the search task easier. The IMEMR is freely accessible in the EMRO website. Twenty-eight journals published in KSA are indexed in the IMEMR.

c) Saudi Medical Literature (SaudiMedLit). The SaudiMedLit (<http://saudimedlit.com/>) is an ambitious project based on the premises that many Saudi medical journals are not indexed in online databases. It is operated by the Health Sciences Library of the North West Armed Forces Hospital in Tabuk, KSA. Journals included in this database are listed in Table 1.

d) SaudiMedBase. Saudi MedBase is a bibliographic database published by Saudi Medical Journal and covers 9 Saudi medical journals for the period from 1979 to 1999. The database is available on CDROM only and can be purchased through the website of Saudi Medical Journal. The project is very important and aims to fill a notable gap. Obviously, the limitation is the period covered. In addition, the search engine included is primitive. The journals covered in the database are summarized in Table 1.

e) Saudi Research DataBase (SRDB). The SRDB is a service of King Abdulaziz City for Science and Technology and aims to index supported scientific research in KSA. It is not confined to medical field but has the ability to limit the search to medical research only. Most research are not yet published and researchers can find high quality information for health statistics. Using the database website (<http://www.srdb.org>) needs free registration.

2. Registries. Various disease registries are available in KSA although they differ in their scope and geographic coverage. Hence, researchers need to make sure they are aware of the characteristics of each registry before using or interpreting the information. Accessibility of the registries data are minimal and confined to the annual reports when available. Table 2 presents a list of disease registries in KSA. This list is not intended to be comprehensive. Other registries were reported in the literature.³⁻⁵ There are also calls to establish registries for other conditions or procedures.⁶⁻⁸

3. Agencies. **a) Central Department of Statistics & Information (CDSI).** The CDSI was established in

Table 1- Journals published in Saudi Arabia and their indexing status in bibliographic databases.

Journal title	PUBMED	EMBASE	IMEMR	Saudi MedBase	Saudi MedLit	Online full text	Website
Annals of Saudi Medicine	*	*	*	*	*	yes, open access	www.saudiannals.net
Annals of Thoracic Medicine	*	*	*		*	yes, open access	www.thoracicmedicine.org
Hematology/Oncology and Stem Cell Therapy	*	*	*			yes, open access	www.hemoncstem.net
International Journal of Health Sciences			*			No	www.ijhs.org.sa
Journal of Infection and Public Health	*		*			Yes	www.sciencedirect.com/science/journal/18760341
Journal of Family and Community Medicine			*		*	Yes	www.ssfcm.org
Journal of the Saudi Heart Association		*	*	*	*	For members	www.sha.org.sa/journal/
Neurosciences		*	*	*	*	Yes	www.neurosciencesjournal.org
Saudi Dental Journal (The)			*	*	*	Yes	www.sdj.org.sa
Saudi Journal of Anaesthesia	*		*			Yes, open access	www.saudija.org
Saudi Journal of Disability and Rehabilitation			*		*	No	www.sjdr.net
Saudi Journal of Gastroenterology	*	*			*	Yes, open access	www.saudijgastro.com
Saudi Journal of Kidney Diseases and Transplantation	*	*			*	Yes, open access	www.sjkdt.org
Saudi Journal of Obstetrics and Gynecology					*	No	
Saudi Journal of Ophthalmology		*	*	*	*	Yes	www.sciencedirect.com/science/journal/13194534
Saudi Journal of Sports Medicine			*		*	No	
Saudi Medical Journal	*	*	*	*	*	Yes	www.smj.org.sa
Saudi Pharmaceutical Journal		*	*			Yes	www.sciencedirect.com/science/journal/13190164
Journal of the Saudi Society of Dermatology and Dermatologic Surgery						Yes	www.jssdds.org
Saudi Journal of Oto-Rhino-Laryngology Head and Neck Surgery			*			Yes	www.orldsociety.org.sa
Saudi Epidemiology Bulletin			*			Yes	www.fetp.edu.sa/bulletin.php
Urology Annals	*		*			Yes, open access	www.urologyannals.com

*available in the database, EMBASE - Excerpta Medica Database, IMEMR - Index Medicus for the Eastern Mediterranean Region, SaudiMedLit - Saudi Medical Literature

1960 as a part of the Ministry of Finance and National Economy, and was then transferred to the Ministry of Planning in 1995.⁹ The CDSI is probably the most important source for researchers looking for statistics on any topic in KSA. The CDSI collects information from all other governmental agencies in the country, in addition to collecting primary data by conducting their own surveys and censuses.

Census. Four censuses have been conducted in KSA. The first census was in 1974 when the total Saudi population was 6.2 million, the second in 1992 showing a total population of 12.3 million, and the last census was conducted in 2004 estimating the total Saudi population to be 16.5 million. The last census was just conducted in 2010, only 6 years after the previous census in accordance with the decision of the Gulf

Table 2 - Disease registries in Saudi Arabia.*

Registry	Start year	Coverage	Publication, (year of last report)	Website
National Cancer Registry (NCR)	1992	National	Annual report (2004)	NA
Cleft Lip / Palate and Craniofacial Anomalies	1999	KFSHRC	Cumulative Report (2008)	http://rc.kfshrc.edu.sa/clcp_net/
Congenital Heart Defects Registry	1998	King Faisal Heart Institute, Prince Sultan Cardiac Center, King Fahad Medical City, Maternity Children Hospital (Al-Dammam)	Annual report (2007)	http://rc.kfshrc.edu.sa/chd_program/
National Epilepsy Registry	1999	Participating institutes: KFSHRC, Riyadh Military Hospital, King Fahad National Guards Hospital, King Fahad Medical City, Riyadh	Annual report (2008)	http://rc.kfshrc.edu.sa/bssc/Epilepsy/
National Diabetes Registry	NA	NA	NA	http://www.diabetes.org.sa
Neural Tube Defect Registry	2000	KFSHRC, the Disabled Children's Association, King Saud Medical Complex	Cumulative Report (2008)	http://rc.kfshrc.edu.sa/ntd/
Neuromuscular Diseases Registry	2003	KFSHRC	Annual Report (2008)	http://rc.kfshrc.edu.sa/nmdr/
Thromboembolic Registry	2001	KFSHRC	Cumulative Report (2008)	http://rc.kfshrc.edu.sa/TEDR_New/
Pan Arab Liver Transplantation Registry	2005	KFSHRC	Annual Report (2008)	http://rc.kfshrc.edu.sa/ltr/

*the list is not intended to be a comprehensive list of all disease registries in Saudi Arabia, KFSHRC - King Faisal Specialist Hospital and Research Centre, NA - not available

Cooperation Council (GCC) to conduct population census at the same time in all Gulf states every 10 years starting from 2010. The census questionnaire collects demographic, social, economic, health, and educational information.

Sample surveys. In addition to census, CDSI conducts surveys using population samples drawn from the whole population. The CDSI conducts 2 main surveys: demographic, and social surveys. The latter includes Consumption Expenditure Survey and Labor Force Survey. The results of these surveys are available online at CDSI website. Using a sample rather than the whole population enables these surveys to collect more information, and thus, provide more in-depth data. An example from the health field is disability. While the census provide data on the distribution of disability by age, gender, and geographic area, the demographic surveys give more insight into the type, causes, and duration of disability in addition to its distribution by education, marital status, and parents consanguinity. One of the strength points worth mentioning in these surveys is utilizing a sampling frame based on the census. This sampling frame is the most complete for household surveys, and researchers planning to carry out any household survey in KSA should consider utilizing this resource instead of relying on much less appropriate sampling frame. The CSDI has 2 important publications: Statistical Yearbook, and the Yearly

Statistical Indicator. The Statistical Yearbook is the most important and comprehensive CDSI publication. It is published yearly and contains statistical data obtained from CDSI projects, other governmental agencies, and non-governmental agencies. It was first published in 1965, and all issues can be downloaded from CDSI website giving a wealth of information on KSA from 1965 until the current years.¹⁰ The Yearly Statistical Indicator provides summary statistics on the most needed areas in a concise form and distributed as a printed material. It can be requested from CDSI or their offices in various regions of KSA.

Researchers are encouraged to explore the website of CDSI to be familiar with other publications that may satisfy some aspects of their needs. Geographic data can be obtained as ready-to-use maps from the publication "Population Atlas," which can be downloaded for free from the CDSI website, or by using the online engine to produce the required maps.¹¹

b) Ministry of Health. The Statistics Department at the MOH is the logical starting point for anyone looking for health statistics in KSA. Through MOH website, researchers can access the 2 main publications compiling health statistics reported to MOH, namely, the Health Statistical Yearbook and Annual Mortality Report. The Health Statistical Yearbook summarizes a wealth of data covering health status, various reported diseases, health resources, activities and services, and

Hajj health services. One difficulty that researchers will face in using this resource is the presentation of raw data (absolute numbers) of disease events instead of rates in most of the tables. The Annual Mortality Report presents statistics on mortality in the following categories: general mortality, perinatal, infant, under-5, maternal, circulatory system diseases mortality, and road traffic accidents mortality. Distribution of death by cause, place, age, gender, nationality, and disease category is presented in the report. At the time of preparation of this manuscript, the latest report available on the website was for the year 2005.

c) Other governmental agencies. Various governmental agencies are producing statistics that could be of interest to health researchers. Data are usually presented by these agencies as periodic reports or summary tables. Table 3 presents examples of governmental agencies and potential statistics produced by them that are of potential interest.

4) Societies, associations and centers. Various associations and scientific societies exist in KSA. These are potential source of data on their topics of interest, whether they are producing the data themselves, or just keeping reference to related studies produced by others. The following are just 2 examples:

a) Saudi Center for Organ Transplantation. The Saudi Center for Organ Transplantation was established in 1993 superseding the previous National Kidney Foundation. The center publishes an annual report wherein you can find statistics related to hemodialysis and organ transplantation in KSA. The center publications can be accessed at their website (<http://www.scot.org.sa/>). The Saudi Journal of Kidney Diseases and Transplantation is the official publication of the center.

b) Prince Salman Center for Disability Research (PSCDR). The PSCDR focuses on disability-related research starting from needs assessment, priority setting, grant funding and dissemination. Results of research funded by the center can be obtained by contacting the center. A list of completed research projects along with their summary can be accessed at the center's website (<http://www.pscdr.org.sa>).

5. International resources. a) WHO EMRO office. The website for WHO EMRO office (<http://www.emro.who.int>) is the next step for researchers looking for health statistics on KSA. It provides a country profiles web page where the essential indicators are listed for each country in the region. In addition, data on special areas can be found in the corresponding section in the website. For example, smoking statistics can be found in the Tobacco Free Initiative section. The same applies for statistics on malaria or tuberculosis.

b) World Health Organization. The WHO represents the international body for health, and hence, it collects information from all state countries through various programs. The WHO website contains a lot of health statistics and makes them accessible through periodic reports and online databases. The researcher needs to explore sections related to his/her topic of interest as different programs publish separate reports.

The WHO Statistical Information System (WHOSIS) is the main starting place, and provides an accessible resource of health statistics compiling data from all member states. Data are provided using an interactive database that allows users to generate customized tables and charts for the selected indicators and countries. Compiling data in one place and interactivity are the major advantages of the WHOSIS database for the researchers. Comparing 2 or more countries is another

Table 3 - Examples of governmental agencies providing data of potential interest for health researchers.

Agency	Data presentation	Example of topics of potential interest for health researchers	Website
Ministry of Education	summary tables	School students number and distribution by geographic location and educational level Schools number and distribution in the country Students distribution in governmental and private schools	http://www.moe.gov.sa
Ministry of Commerce and Industry (MOCI)	summary tables, annual report, quarterly reports	Distribution of factories by region and type of industry, industrial workforce by occupation	http://www.commerce.gov.sa
Ministry of Labor	summary tables, annual report	Employment statistics: unemployed distribution by age and educational level, distribution of workers by age, gender, occupation, nationality, and education	http://www.mol.gov.sa
Ministry of Municipal and Rural Affairs	summary tables	Zoonotic diseases, health inspection activities, violations of hygiene rules	http://www.momra.gov.sa
Ministry of Agriculture	summary tables, annual report	Avian flu, Rift Valley fever, veterinary medicine	http://www.moa.gov.sa

useful feature. In addition to the interactive database, World Health Statistics report is published annually in printed and digital format, and can be downloaded from the WHOSIS web page. The report is available in 6 languages including Arabic language.

c) *World Bank. Data and Statistics section.* Data and Statistics section at the World Bank website is a convenient source of international data. Health, nutrition, and population database will be the most relevant, although other databases may be of interest to health researchers, such as education, millennium development goals, and world development indicators. Databases allow users to compare countries, and to compare specific country with regional, as well as high-income countries statistics. Customized tables can be exported to Excel sheet and downloaded to the user's computer. Data visualizer is a unique and useful feature for people working on presentations and like to attract the attention of audience, while at the same time presenting a wealth of information. It is based on flash animation and displays time trend of indicators over the years.

Caveats. Users of health statistics produced by various agencies need to take care on why and how the raw data were collected. The purpose of raw data collection can affect the scope and standards of collected data. Definition of diseases including diagnostic tests and thresholds used may vary between different sources. For example, national surveys reporting the prevalence of diabetes in KSA have used various definitions of diabetes including participant's reporting of physician-diagnosed diabetes, random blood sugar testing, fasting blood sugar testing, and oral glucose tolerance test.¹² Target population and sampling frame may also differ between sources. Again, some national surveys have used sampling frames based on primary health care files, while other surveys have used more complete household listing. A final caveat is related to comparing data between different regions. For example, data based on primary health care services may not be comparable, since primary health care utilization is not consistent in all regions in KSA.

In conclusion, health statistics in KSA are sometimes difficult to find. Searchers need to familiarize themselves on various potential sources, to explore more than one source when conducting their search, and to know how to search these sources. Updated information is highly needed, and the internet provides an accessible

and convenient channel for sharing information with regular, and fast updating. It is recommended that agencies producing statistics need to make data available for researchers, update statistics regularly, and more fully utilize the internet for this purpose.

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