Accuracy of Physician Directories in Tehran Considering the Present Situation and Improvement Suggestions

Afsoon Aeenparast [1]; Farzaneh Maftoon [1,*]; Faranak Farzadi [1]; Mehdi Rezaei Yazdeli [2]

[1]Health Services Management Group of Health Metrics Research Center, Iranian Institute for Health Sciences Research, ACECR, Tehran, IR Iran
[2]Department of Financial Affairs, Social Security Organization, Tehran, IR Iran

Corresponding author: Farzaneh Maftoon, Health Services Management Group of Health Metrics Research Center, Iranian Institute for Health Sciences Research, No. 23, Nazari St. Felestin St. P.O. Box: 131451756, Tehran, IR Iran. Tel: +98-2166480804, Fax: +98-2166480805, E-mail: Fmaftoon@ihsr.ac.ir

Background: Physician directories are among the most important databases in health systems.
Objectives: The aim of this study was to estimate the accuracy of physician directories in Tehran, Iran.
Materials and Methods: This was a cross-sectional study. Tehran, the capital of Iran, was selected for study. Specialists', fellowships' and subspecialists' information were extracted from Islamic Republic of Iran Medical Council (IRIMC) website and completed using the White Book. The data were gathered through telephone interviews in 2010, which included the physicians' names, sexes, types of specialties, office phone numbers, and office addresses.
Results: The information of 5475 physicians was extracted from databases. The findings showed that 59.2% of phone numbers were registered correctly. These structural and functional defects may occur due to incomplete updating cycles.
Conclusions: The study findings reflected the necessity of establishing revision cycles in studied databases and providing a basic framework for a national medical directory.

Keywords: Physicians; Directory; Dimensional Measurement Accuracy; Iran

1. Background

Physician directories are among the most important databases in health systems. It shows the number and distribution of physicians in a distinct area. The ratio of different medical specialties could also be estimated using physician directories. Such databases could be used by governments and professional associations for medical human resource planning or national surveys (1-4). It could also be used by patients when they need to contact or have access to doctors (5).

There are two main physician directories in Iran: Islamic Republic of Iran Medical Council (IRIMC) (6) and the White Book (7). The first one is a free internet online database. The second is published in different ways as paper or electronic book, which has charge. In both databases, physicians are categorized by their specialties and sorted in each specialty by alphabetical order according to their last names.

The accuracy of physician databases has previously been questioned in other countries from different aspects. Some studies have only considered the accuracy of databases (8, 9), while others analyzed over- or under-estimation of existing physicians (10-12). In some other studies, the updating cycles of medical directories were also considered (13-15). Studying the quality, quantity and accuracy of information about the physician directories may lead to discovering the required changes for their improvement (16, 17).

2. Objectives

This study was designed for estimating the accuracy rate of physician directories in Tehran.

3. Materials and Methods

This was a cross-sectional study. Tehran, the capital of Iran and the concentration area of physicians, was selected as the study region. Afterwards, all medical specialists, fellowships and subspecialists of Tehran were extracted from IRIMC. For completing the physician's in-practice list, White Book was used as the additional source of information. This process was tended to prepare a complete list of physicians (specialists and subspecialists) of Tehran. Afterwards, cases with incomplete information (without phone numbers) or old phone numbers (less than eight digits) were eliminated from the list; thus, 5475 cases remained.

Telephone interviewing method was used for data gathering during 4-9 pm in all working days. The gathered data included the physician's name, sex, specialty, office phone number, and office address.

Contacts with no responses or busy numbers were reconnected during the week. Data gathering lasted six months, from July to December 2010. SPSS statistical software was used for data analysis.

4. Results

The information of 5475 physicians was extracted from

Table 1. The Frequencies of Answered (Incorrect and Correct) and no Answer Numbers in the Studied Databases

Group	No. (%)	Percentage in Each Group
No answer		
No response	684 (12.5)	89.2
Busy phone number	7 (0.1)	0.9
Disconnected phone line	76 (1.4)	9.9
Total	767 (14.0)	100.0
Incorrect numbers		
Number change	864 (15.8)	58.9
Address change	290 (5.3)	19.8
Migration	172 (3.1)	11.7
Death	79 (1.5)	5.4
Retirement	62 (1.1)	4.2
Total	1467 (26.8)	100.0
Correct numbers	3241 (59.2)	-
Total	5475 (100.0)	-

the databases. Among the physicians, 24.1% (1320) were registered in IRIMC, 56.3% (3085) in White Book, and 19.5% (1070) in both.

Studying the gathered data showed that 14.0% (767) of numbers did not answer and the remaining 86.0% (4708) answered the phone calls; 26.8% (1467) of numbers were incorrect. The main reasons for existence of incorrect numbers were death, retirement or migration of physicians, and phone number changes. Of numbers, 59.2% were registered correctly; it means that the number was answered, it was correct, and the clinic was active (Table 1).

The accuracy rate was 59.2%. This rate was estimated 67.5% in IRIMC and 57.5% in White Book. Therefore, the accuracy rate was higher in IRIMC (P < 0.0001).

5. Discussion

Physician directories are important databases in health systems. They could be used in macro and micro level decision makings. In macro level, they are used for defining the number and distribution of physicians or handling national surveys. In micro level, they are useful for patients in selecting or finding their target specialists (1-5).

The study findings indicated that our databases did not adequately reflect all the physicians registered to practice in Tehran. The accuracy rate was estimated 60%. This is common in all databases with some differences. For example, the accuracy rate was estimated 90% in medical council of Jamaica (2667 registered and 2399 in practice physicians) (12). Nearly half of the cases registered in our databases in this study were incorrect. The main reasons of inaccuracy can be categorized in two groups: 1. There were physicians who were registered, but had migrated, been retired or dead. This rate was estimated 5.7% in our study. This probably caused over-estimation of the num-

ber of physicians. 2. There were physicians who were registered, but their phone number had been changed. This rate was estimated 21.1% according to the study findings. This failure may limit accessibility to physicians and lead to inaccurate estimation of the physicians' distributions. By the way, some cases did not answer, so we were not sure about their information accuracy; this rate was 14.0%. This may also limit the accessibility to physicians.

Lack of proper updating cycles may lead to these structural and functional defects. For example, American Medical Association (AMA) was not regularly updated with respect to retirement of physicians, causing overestimation of the physicians' numbers (8, 18). At first, the updating processes should be established; then, time cycles should be defined considering the characteristics of the system. Therefore, reviewing the workflow of each database is necessary. All physicians who want to practice through the country should register in IRIMC. Therefore, this database is well-designed for considering new entries. However, there is no defined process for eliminating dead, retired or migrated physicians from the list. This also applies for updating the phone numbers and addresses, since these data are only updated when physicians voluntarily refer to IRIMC for receiving some services.

The other studied database, White Book, is related to a nongovernmental publisher, established for commercial purposes. Hence, it may not consider all in-practice physicians and may underestimate their number. On the other hand, it was supposed to be revised yearly, but has not been updated so far; some structural and financial barriers have been the main causes of this negligence. This limitation decreased the database accuracy as well. Therefore, it has not been proposed for consideration in the structure of national medical directory.

The registration process of these databases, which was explained above, was inconsistent with the number of records in databases. It means that the entry process of IRIMC was more complete, but the frequency of registered cases in White Book was higher. More searches in IRIMC database showed that its access imitation (access to only 200 registered cases in each specialty according to alphabetical order) causes this matter. In fact, the information in this database is more than what is available. This limitation not only may cause under-estimation of in-practice physicians, but also will reduce the access to physicians' information at the end of the alphabetical list. Eliminating this limitation will increase the available cases in this database and turn IRIMC to the core national medical directory.

Both medical directories should try to define revision or updating phases for eliminating dead, retired or migrated physicians as well as updating the phone numbers and addresses periodically to increase the accuracy of information. However, it is beneficial to design a national network that connects different responsible organizations such as death registry, medical evaluation organizations, and medical sciences universities in Iran, to present their

information about physicians' death, retirement or migration to medical directories, especially IRIMC. This can present a basic structure for national medical directories. This network will provide a continuous flow of information, which helps to update the physician directories.

Acknowledgements

Authors' Contributions

Study concept and design: Afsoon Aeenparast, Faranak Farzadi. Acquisition of data: Mehdi Rezaie. Analysis and interpretation of data: Afsoon Aeenparast, Farzaneh Maftoon. Drafting of the manuscript: Afsoon Aeenparast, Farzaneh Maftoon, Faranak Farzadi, Mehdi Rezaie. Study supervision: Afsoon Aeenparast.

Funding/Support

References

1. CIHI. *NPBD data submission specifications manual.* Canada: Canadian-Institute-for-Health-Information (CIHI); 2009. [cited 30.3.2012]. Available from: http//:www.cihi.ca/CIHI-ext-portal/pdf/internrt/data-SUB-REQ-NPDB-v4-EN.
2. Briley LC, Harrell SP, Woosley A, Eversmann J, Wo JM. National survey of physicians' perception of the cause, complications, and management of gastroparesis. *South Med J.* 2011;**104**(6):412–7.
3. Perry JJ, Mansour M, Sharma M, Symington C, Brehaut J, Taljaard M, et al. National survey of Canadian neurologists' current practice for transient ischemic attack and the need for a clinical decision rule. *Stroke.* 2010;**41**(5):987–91.
4. Zettler M, Mollon B, da Silva V, Howe B, Speechley M, Vinden C. Family physicians' choices of and opinions on colorectal cancer screening modalities. *Can Fam Physician.* 2010;**56**(9):e338–44.
5. Special Databases.. *Canadian Doctor Fax numbers list database* . Canada: Special Databases; 2012. Available from: http://www.specialdatabases.com/Canadian-doctors-physicians-fax-list.html.
6. IRIMC. *Doctor search engine.* Iran: Islamic-republic-of-Iran-medical-council-(IRIMC); 2011. [cited 13.6.2011]. Available from: http://www.irimc.org/DoctorSearchEngine/Search.aspx.
7. Hayyan.. *[White Book].*Tehran: Iran Medical Directory; 2011.
8. Knight-Madden J, Gray R. The accuracy of the Jamaican national physician register: a study of the status of physicians registered and their countries of training. *BMC Health Serv Res.* 2008;**8**:253.
9. Ventegodt S, Merrick J. A review of the Danish National Drug Directory: who provides the data for the register? *Int J Adolesc Med Health.* 2010;**22**(2):197–212.
10. Kletke PR, Polsky D, Wozniak GD, Escarce JJ. The effect of HMO penetration on physician retirement. *Health Serv Res.* 2000;**35**(5 Pt 3):17–31.
11. Ricketts TC, Hart LG, Pirani M. How many rural doctors do we have? *J Rural Health.* 2000;**16**(3):198–207.
12. Konrad TR, Slifkin RT, Stevens C, Miller J. Using the American Medical Association physician masterfile to measure physician supply in small towns. *J Rural Health.* 2000;**16**(2):162–7.
13. Chen L, Evans T, Anand S, Boufford JI, Brown H, Chowdhury M, et al. Human resources for health: overcoming the crisis. *Lancet.* 2004;**364**(9449):1984–90.
14. Lovkyte L, Reamy J, Padaiga Z. Physicians resources in Lithuania: change comes slowly. *Croat Med J.* 2003;**44**(2):207–13.
15. World-Health-Organization.. *Working together for health: the World Health Report 2006.* Geneva: World Health Organization; 2006. Contract No.: 92 4 156317 6.
16. Shelton L, Fund C. *Recommendations for improving the quality of physician directory information on the internet.*: Commonwealth Fund; 2004. Available from: http://www.cmwf.org/publications/publications_show.htm?doc_id=221298.
17. Hong Y, Gillis RD, Donnell RF. Use of consumer health vocabularies in online physician directory to improve physician search. *AMIA Annu Symp Proc.* 2008:974.
18. Tikoo M. Assessing the limitations of the existing physician directory for measuring electronic health record (EHR) adoption rates among physicians in Connecticut, USA: cross-sectional study. *BMJ Open.* 2012;**2**(6).