



## Geographical distribution of pharmacies in two provincial capitals in Iran

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### ABSTRACT

**Background:** Access to medications is affected by multiple factors including distribution of pharmacies. Improvement of access to medications is of the main goals of the National Drug Policy (NDP) of Iran. The aim of this study was to assess the geographical distribution of pharmacies within two provincial capitals in Iran. **Material and Methods:** Two Southwestern provincial capital cities; Khorramabad and Ahwaz, were selected. As each city in Iran is divided to several districts called municipal areas, the population percentages and the percentage of pharmacies located in each area were calculated. Areas' pharmacy distributions were compared in order to create an overview of the present status of distribution and access to pharmacies in each area. **Results:** Ahwaz and Khorramabad with populations of approximately 1,000,000 and 5,200,000 are separated into eight and three municipal areas, respectively. The results showed that there is one pharmacy for every 5,600 persons in Ahwaz and one pharmacy for every 8,155 persons in Khorramabad. **Conclusion:** Based on this study, pharmacy distribution is not proportional to population in neither Ahwaz nor Khorramabad. This can be explained by the fact that physicians are mostly concentrated in central areas attracting pharmacists to the same locations.

**Keywords:** Pharmacy distribution, Population distribution, Access to medicine, Ahwaz, Khorramabad.

### 1. Introduction

Pharmacies supply patients with medications, medical equipment, and cosmetics. Pharmacies in Iran are categorized into either state or private and operating either within a normal working hours/week or 24/7.

The Ministry of Health (MOH) has direct authority over state pharmacies and guarantees their procurement and dispensing of drugs, whereas its role in private pharmacies is limited to supervision.

Easy access to medications is one of the main goals of National Drug Policy (NDP) of Iran, and specific sections of Iranian pharmaceutical laws and regulations ensure every Iranian's access to the medicines listed in the Iranian Drug List (IDL). Access to medicine encompasses multiple factors, including rational selection and use of medicines, affordable prices, sustainable financing, and reliable health and supply systems [1]. Pharmacies, as a part of the health system, have a key role in providing people with access to medicine. Thus in order to ensure access to medicine, the number and distribution pattern of pharmacies should be organized. Regarding this fact, policymakers consider several factors when opening a new pharmacy, such as the number of people served per pharmacy, distance between pharmacies, and socioeconomic status [2]. Since access to medicine is highly impressed by proportionality between pharmacies and population size, the present study aims to evaluate this factor in two provincial capital cities; i.e. Ahwaz and Khorramabad, in Iran. Ahwaz is the provincial capital of Khuzestan, a province that mostly is impacted by the Iran-Iraq war, and Khorramabad, the provincial capital of Lorestan, as one of the most historical cities of Iran.

### 2. Method

Two Iranian cities with cultural and socioeconomic differences; i.e. Khorramabad and Ahwaz- were selected. In order to evaluate the correlation between population and number of pharmacies in these two cities, the population data for both cities were obtained from state government databases. As each city in Iran is divided to several districts called municipal areas, the population size for each area was studied

separately. In the next step the lists of pharmacies in Ahwaz and Khorramabad were acquired from the Food and Drug deputies in the two cities. Using their addresses, the locations of pharmacies were pinpointed manually using Google Maps Street View photographs. The proportion of population in each area to the total population was calculated and the same was performed for the pharmacies in each area. In order to develop a more comprehensive view of the present status of distribution and access to pharmacies, distribution of different types of pharmacies was also obtained.

### 3. Results

Ahwaz and Khorramabad are two cities in the Southwest of Iran with 1,000,000 and 520,000 residents and divided into eight and three municipal areas, respectively (Fig. 1).

#### Ahwaz

In Ahwaz, there were 90 pharmacies (98% were operating during working hours, and 2% in 24/7) providing service to 1,064,177 people. This means that there was one pharmacy for every 5,600 people. Furthermore, there was one daytime pharmacy for every 5721 people and one 24/7 pharmacy for every 266,000 people. The number of pharmacies in each area ranged from 15 to 45. The distribution of pharmacies in one to eight areas were: 23.7%, 12.6%, 11.6%, 9.5%, 12.6%, 13.2%, 7.9%, 8.9%, respectively and distribution of the population were 9.8%, 8.8%, 15.6%, 17.8%, 6.6%, 15.7%, 13.5% and 12.2%, respectively. It is noteworthy that we found no area without pharmacy (Table 1) (Fig. 2a.).

#### Khorramabad

A total number of 64 pharmacies were operating in Khorramabad city (92% were daytime pharmacies and 8% were 24/7). Considering the city's population of 521,964, there was one pharmacy per 8,155 people. In addition, there was one daytime pharmacy for every 8847 people and one 24/7 pharmacy for almost every 104,000 people. The number of pharmacies in the three areas were 18 (28%), 34 (53%) and 12 (19%),

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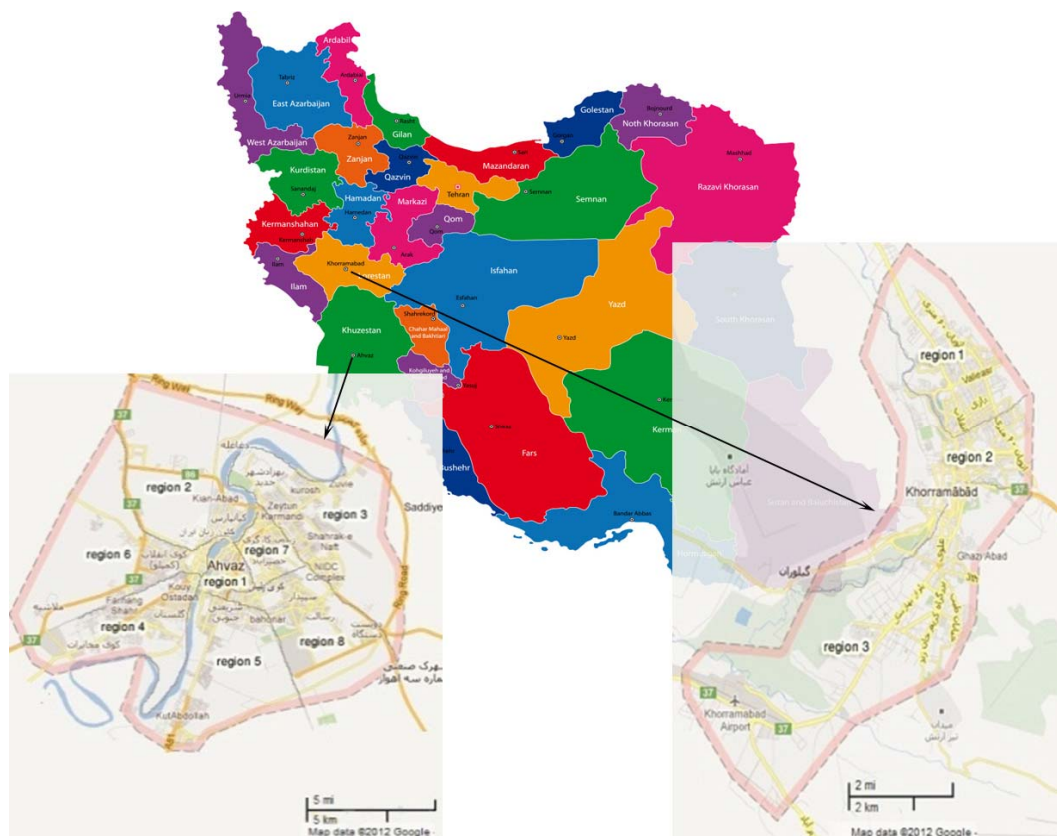


Fig.1.Municipal areas of Ahwaz and Khorramabad.

and distribution of population in areas one to three were 46%, 36% and 18%, respectively. It should be noted that we found no area without pharmacy (Table 2) (Fig. 2b.).

#### 4. Discussion

The results suggest that pharmacy distribution is not proportional to population in neither Ahwaz nor Khorramabad. This could be due to the relaxation of licensing for pharmacies, which has resulted in pharmacies being located in central areas where physicians are mainly concentrated. Moreover, since the assessed cities are provincial capitals, medical tourists from surrounding counties come to these cities to take advantage of the medical services available. This can partly justify the high concentration of pharmacies and physicians.

World Health Organization (WHO) aiming to improve health is working with countries to ensure drug quality and safety, rational use of drugs and equity in access to medications [3]. Studies conducted to assess these indicators can be useful for decision makers in health care system allowing them to develop a clear image of the actual service they provide to public.

This study has certain limitations. It focused only on the geographical

distribution of pharmacies and provided no list of available pharmaceutical products at each pharmacy. The second issue was that the applied database used the residential address information of inhabitants and overlooked the proximity of pharmacies to workplaces, for example. Finally, the limited number of observations (total number of 11 areas) made statistical inference impossible.

Several laws for adjusting pharmacy distribution have been enacted in Iran to create balance between population density and the number of pharmacies and their distribution.

The Iranian Pharmacies Regulations Act 2006, Article 11, has set one daily pharmacy for every 6000 people as standard [2]. This study demonstrates that this standard has been followed in Ahwaz – one daily pharmacy for every 5600 people- but not in Khorramabad, where each pharmacy provides service to an average of 8155 people. These figures therefore reflect an acceptable availability of pharmacy service to the public in Ahwaz, but a less satisfactory situation in Khorramabad. In Article 12 of the same act, at least one 24/7 pharmacy is required for every 65,000 people [2]. Nonetheless, the study showed that each 24/7 pharmacy served a considerably higher number of people-one 24/7 pharmacy for every 266,000 and 104,000 people in Ahwaz and

Table 1. Distribution of pharmacies and population in eight areas in Ahwaz

Region	Total pharmacy	Daytime pharmacy	24/7 pharmacy	Population
1	45 (23.7%)	43 (22%)	2	105516 (9.9%)
2	24 (12.6%)	24 (12%)	-	93347 (8.8%)
3	22 (11.6%)	22 (11%)	-	165950 (15.6%)
4	18 (9.5%)	17 (8%)	1	188903 (17.8%)
5	24 (12.6%)	24 (12%)	-	69953 (6.6%)
6	25 (13.2%)	24 (12%)	1	167300 (15.7%)
7	15 (7.9%)	15 (7.8%)	-	143303 (13.5%)
8	17 (8.9%)	17 (8.9%)	-	129905 (12.2%)
Total	190	186 (98%)	4 (2%)	1064177
Population /Pharmacy				<b>5600</b>

Table 2. Distribution of pharmacies and population in three areas in Khorramabad

Region	Total pharmacy	Daytime pharmacy	24/7 pharmacy	Population
1	18 (28%)	17 (27%)	1	237255 (45%)
2	34 (53%)	31 (48%)	3	189805 (36%)
3	12 (19%)	11 (17%)	1	94904 (18%)
Total	64	59 (92%)	5 (8%)	521964
Population /Pharmacy				8155

Khorramabad, respectively.

Similar laws for adjusting pharmacy distribution have been passed in Saudi Arabia. A study proved a suitable proportion between population and pharmacy distribution pattern in Riyadh -one pharmacy for every 4,464 person. However, newly established districts had no pharmacies [4].

Gilbert's study also pointed out the same imbalanced pharmacy distribution in South Africa. The proportion of population to pharmacies in ten provinces of South Africa was lower than 11,000 in three provinces and ranged between 17,000 and 64,000 in the other provinces [5].

Law et al used travel distances to evaluate access to pharmacies and confirmed an acceptable distribution of pharmacies in Ontario, Canada [6].

## 5. Conclusion

The study revealed an unsatisfactory pattern for the distribution of pharmacies in Ahwaz and Khorramabad. This situation can be as a result of physicians' offices being located mainly in central areas attracting pharmacies to the same locations. Thus in order to counterbalance the distribution pattern of pharmacies, controlling the distribution of physicians' offices is a must.

Future research are suggested in other cities using the same measures in order to acquire a broad view of the geographical distribution of pharmacies when compared to population across the country.

## Conflict of interest

The authors declare no conflict of interest.

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## References

- (1) <http://www.who.int/trade/glossary/story002/en/#.viewed 4/2012>
- (2) Kebriaeezadeh A, Eslamitabar Sh, Khatibi M. Iranian pharmaceutical law and regulations, second ed. Razi distribution, 2008 , Chapter 2, pp199-206.
- (3) Nikfar S., Kebriaeezadeh A., Majdzadeh R, Abdollahi M. Monitoring of National Drug Policy and its standardized indicators; conformigty to decisions of the national drug selecting committee in Iran; BMC International Health and Human Rights 2005,5:5.
- (4) Najjar T. Study on the distribution of community pharmacies in Riyadh, Saudi Arabia, Journal of social and administrative pharmacy, vol20, no 2, 2003, pp72-76.
- (5) Gilbert L. Community pharmacy in South Africa: A changing profession in a society in transition. Health & Place 1998. 4(3):273-285.
- (6) Law MR, Dijkstra A, Douillard JA, Morgan SG. Geographic accessibility of community pharmacies in Ontario, Journal of health care policy 2011. 6(3):36-46.