

Number of Cardiologists in Argentina. Report Based on the Argentine Integrated Healthcare Information System

Número de cardiólogos en la Argentina. Informe basado en el Sistema Integrado de Información Sanitaria Argentino

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ABSTRACT

Knowledge of human resources in the area of health care is vital to make appropriate healthcare decisions. The Argentine Integrated Healthcare Information System (SISA), recently developed by the National Ministry of Health, registers all the active medical professionals in Argentina, and provides official data about the medical workforce. However, these data seem to be incomplete for most specialties. In the case of cardiology, the comparison between the Argentine Society of Cardiology and SISA registries indicates that almost half the number of specialists is not included in the SISA database. If only the official data were considered, we would have an adequate cardiologist-inhabitant ratio (74 cardiologists per million population), but findings in the present study show that this ratio would be much higher, indicating an overpopulation of specialists (140 cardiologists per million population). If health policy decision-makers did not cautiously evaluate preliminary official information from SISA, or did not recognize its precariousness, the true workforce in the specialty would be seriously underestimated. Yet, the SISA registry is a very good initiative, and all the scientific societies should provide information from their databases to improve its validity and usefulness.

Key words: Human resources - Cardiology - Registries - Argentina

RESUMEN

Conocer los recursos humanos en el área de la salud es fundamental para tomar las decisiones sanitarias adecuadas. El Sistema Integrado de Información Sanitaria Argentino (SISA) creado recientemente por el Ministerio de Salud de la Nación registra a todos los profesionales médicos en actividad de la Argentina y provee datos oficiales sobre la fuerza laboral médica. Sin embargo, estos datos parecen ser incompletos en la mayoría de las especialidades. En el caso de la cardiología, el cotejo de los registros de la Sociedad Argentina de Cardiología con los del SISA indica que casi la mitad de los especialistas no están incluidos en esta última base de datos. Si se tomaran solo los datos oficiales, estaríamos con una relación cardiólogo/habitantes adecuada (74 cardiólogos por millón de habitantes), pero los hallazgos en el presente estudio demuestran que este cociente sería mucho mayor e indicaría una superpoblación de especialistas (140 cardiólogos por millón de habitantes). Si los decisores de las políticas de salud no evaluaran con cautela la información oficial preliminar del SISA o no reconocieran su precariedad, podría subestimarse groseramente la verdadera fuerza laboral en la especialidad. De todas formas, debe considerarse que el registro del SISA es una muy buena iniciativa en la que todas las sociedades científicas deberán aportar la información de sus bases de datos a fin de mejorar su validez y utilidad.

Palabras clave: Recursos humanos - Médicos, cardiólogos - Registros, Argentina.

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Abbreviations

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|-----|------------------------------------|------|--|
| FAC | Argentine Federation of Cardiology | SISA | Argentine Integrated Healthcare Information System |
| SAC | Argentine Society of Cardiology | | |

The concurrent issues of Academic Medicine (December 2013) and Health Affairs (November 2013) were dedicated to the analysis of the number of physicians needed in the United States for the next 10-15 years. All published studies considered that there would be a physician shortage and that actions to increase enrollment in the next ten years should be taken. (1, 2) The same analysis was applied for the various specialties in

order to meet the future demand resulting from population growth and healthcare reforms.

At the local level, medical workforce planning has rarely been addressed, although there may be grounds for intervention in the near future. As far as cardiology is concerned, efforts have been made to estimate the local supply and demand of these specialists. Specifically, the true number of active professionals may have

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been overestimated in a previous article about supply of cardiologists in Argentina. (3) A joint work between the Argentine Society of Cardiology (SAC) and the Argentine Federation of Cardiology (FAC) estimated a total of about 7,500 cardiologists for the whole country. The major limitations of that work included lack of official figures on the subject, and no differentiation between really active professionals and those about to retire.

I have recently had access to the new database from the Argentine Integrated Healthcare Information System (SISA), created by the National Ministry of Health, which registers all the active medical professionals in Argentina (<http://sisa.msal.gov.ar>). The system resorts to all the active professional licenses in the country, and allows selection by specialty and location. Search in this database reveals that, in Argentina, there would be 2,968 licensed cardiologists specialized in adults. This figure is significantly lower than the one reported in our article 5 years ago. In this context, these dissimilar new official figures deserve a new presentation of the subject.

The SISA registry includes data from about 3,000 cardiologists, representing the workforce in the specialty nationwide. However, this registry has some inconsistencies that should be pointed out. Depending on when it was updated, the SISA database includes some deceased and some retired inactive professionals, while it lacks data from other active physicians not listed in the registry. In view of these limitations, a series of complementary analyses were carried out to evaluate the alleged supply of cardiologists on the basis of these new data. Table 1 shows the number of cardiologist estimated in the SISA registry according to their current age in years (values separated by age are only a good approximation).

As shown, the difference between the total number of registered professionals and those under 65 years of age and most likely active varies in the range of 23%. In turn, the number of registered pediatric cardiologists totals 138. Five percent of cardiologists are foreigners (149 professionals) possibly specialized in our country.

This information entails the relief that perhaps the true population of cardiologists in Argentina had been overestimated. However, there are still some other points to consider. The importance about the review based on the SISA registry is the inclusion of official data that public decision-making bodies could use to

plan and support health policies in the area of human resources. The rhetoric that reads "more doctors equals more health", instead of "better doctors and infrastructure equals better health", might cause an escalation in the overpopulation of specialists based on policies implemented with unreliable or inconsistent official data. With this view, a broader evaluation of the information provided by SISA is necessary.

In order to analyze its completeness, the SISA registry was compared with the SAC registry of fellow cardiologists. The SAC registry includes 2,887 cardiologists, almost as many as those registered in SISA ($n = 2,986$). For the purpose of the analysis, a random sample of 24% of the SAC registry ($n = 705$) was taken and checked name by name against the SISA registry. Out of these cardiologists, 46.8 % (95% CI 43.1-50.5) were not included in the SISA registry, showing a significant under-reporting of active cardiologists. A similar percentage would be expected for fellow members of the Argentine Federation of Cardiology. Thirty-one percent of non-inclusions corresponded to cardiologists who lived in the province of Buenos Aires, 27% in the city of Buenos Aires, and the rest in the remaining provinces. If the number of cardiologists in the SISA registry is corrected by the difference found with the SAC registry, and the same difference is presumed for the FAC registry and for those professionals not registered in any scientific society, the number of cardiologists in Argentina would be 5,872 (95% CI 5,490-6,311) instead of 2,986.

To analyze the consistency of these data beyond cardiology, the results published by Abramzon (4) on the number of physicians from different specialties were compared with those registered by SISA (Table 2).

The comparison shows that most SISA data are much lower than previous estimations, although the SISA registry does show an increase of the total number of physicians in the country since 2004. These differences may be due to SISA under-reporting or to the fact that most physicians work as specialists despite they are not.

With the aim of analyzing the supply and demand for cardiologists in Argentina, the optimal reference value was defined as the recommended number of cardiologists per million population, determined by the following model of demand: (5)

Number of cardiologists per 100,000 population

0 to 14 years: 1 cardiologist
 15 to 44 years: 4 cardiologists
 45 to 64 years: 7 cardiologists
 ≥ 65 years: 9 cardiologists

Table 1. Number of Argentine cardiologists by age included in the SISA registry

| Age | N° of cardiologists |
|-------------|---------------------|
| < 65 years | 2.312 |
| 65-70 years | 204 |
| 71-75 years | 133 |
| > 75 years | 337 |
| Total | 2.986 |

For the following analysis, the recommended number of cardiologists for adult patients and for pediatric patients was considered separately. Population data estimated for 2013 were used (≈ 42 million inhabitants), based on the projected data from the 2010 national census. The number of cardiologists required

Table 2. Comparison of the number of specialists based on two sources [Abramzon (4) and SISA]

| Specialty | Abramzon | SISA | Difference |
|------------------------------|----------|-------|------------|
| Anesthesiology | 4,400 | 1,322 | -70% |
| Cardiology | 8,000 | 2,986 | -63% |
| General Surgery | 4,189 | 3,045 | -27% |
| Plastic Surgery | 300 | 950 | +217% |
| Dermatology | 4,800 | 1,195 | -75% |
| Gastroenterology | 630 | 1,004 | +59% |
| Gynecology | 3,166 | 2,504 | -21% |
| Nephrology | 774 | 623 | -20% |
| Neurology | 680 | 776 | -14% |
| Ophthalmology | 2,685 | 1,699 | -37% |
| Orthopedics and Traumatology | 3,269 | 2,111 | -35% |
| Otorhinolaryngology | 2,450 | 809 | -67% |
| Pathology | 988 | 665 | -33% |
| Pediatrics | 13,391 | 6,583 | -51% |
| Psychiatry | 1,834 | 3,596 | +96% |
| Urology | 1,500 | 70 | -53% |

for the adult population in Argentina was estimated in 1,698 professionals and in 102 for the pediatric population. Therefore, the current number of cardiologists would exceed by 76% the recommended number for the adult population and by 35% for the pediatric group, according to SISA data. Furthermore, by correcting SISA data against the SAC registry, the number of cardiologists would exceed by 226% the recommended value.

Figure 1 shows a comparison between the number of cardiologists per million population in Argentina with data from the USA and European countries. (6, 7) This comparison reveals that there would be 74 cardiologists per million (adult and pediatric) population according to the SISA registry, and 140 when it is corrected based on the SAC registry.

Although the SISA data rank Argentina (together with the USA) in a reasonable position regarding the ratio of cardiologists to population, the correction against the SAC registry ranks the country in an undesirable position as a result of overpopulation of specialists.

The expected annual retirement rate for cardiologists is 1.6% if the cut-off point is 70 years, while the global mortality rate for these professionals is the same as that for the general population: 0.76%. In turn, the expected annual rate of new cardiologists is 200, according to the staff of residents in the specialty registered in the Argentine Council of Residents in Cardiology (CONAREC). Based on the rates proposed, the following simulations depict the possible evolution of the number of cardiologists in Argentina for the next 10 years. Figure 2 shows the growth in the total number of cardiologists nationwide, year after year,

according to the baseline data of the official and corrected SISA registry.

Figure 3 illustrates the equivalent number of cardiologists per million population, considering an annual population growth rate of 1.01% and an annual global mortality rate of 0.76%.

Figures 2 and 3 demonstrate that, given the current difference between the level of inclusion of new cardiologists into the workforce and the retirement and mortality rates, the total number of professionals in the specialty will increase in the next 10 years. Every year, about 200 new cardiologists from the residency programs throughout the country are incorporated into the specialty. In Figure 4, the results of the simulation show that a reduction of at least 75% in the incorporation of new specialists is necessary just to maintain the current number of active cardiologists. That would be equivalent to including 50 new

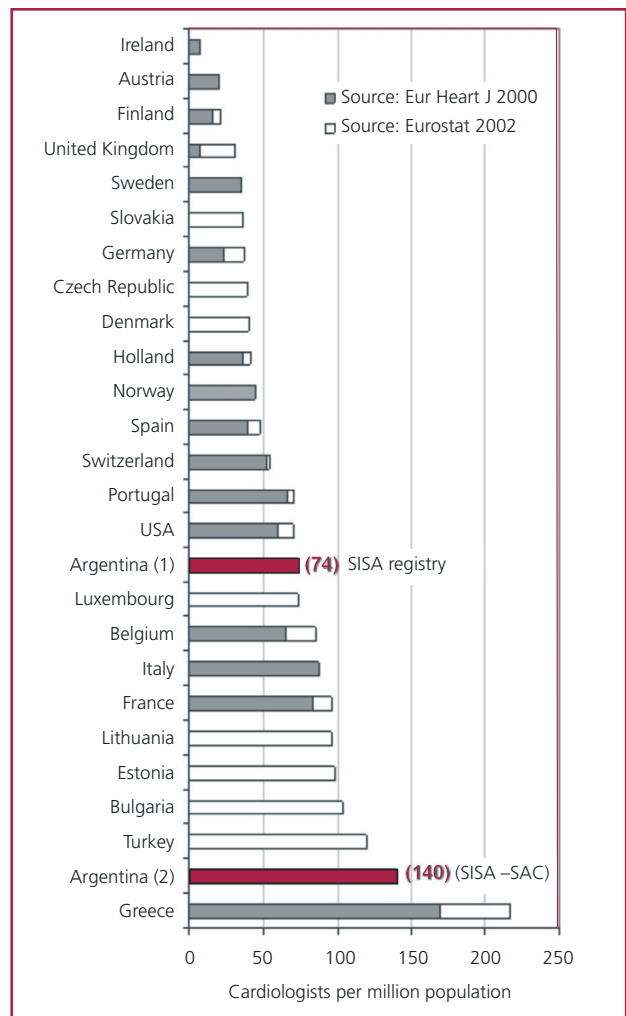


Fig. 1. Number of cardiologists per million population in Europe, USA, and Argentina. The stacked bars correspond to the data provided by two different sources (references 6 and 7). In the case of Argentina, the estimate is for 2014, according to the SISA official registry and the one corrected with the SAC registry (SISA-SAC).

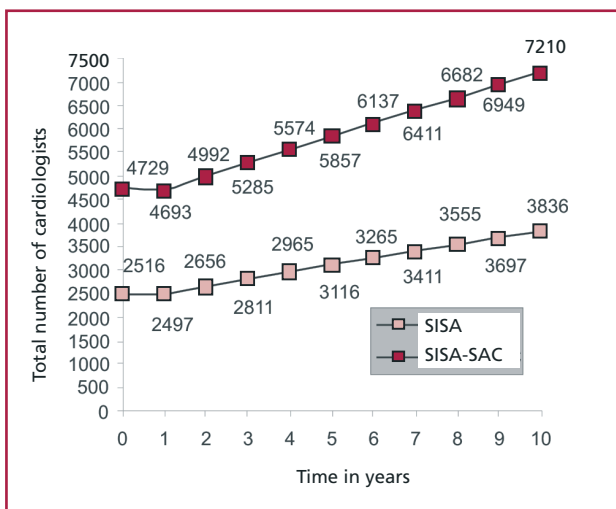


Fig. 2. Simulation to demonstrate the potential growth of the total number of cardiologists in Argentina over the next 10 years, according to baseline data from SISA and SISA-SAC registries.

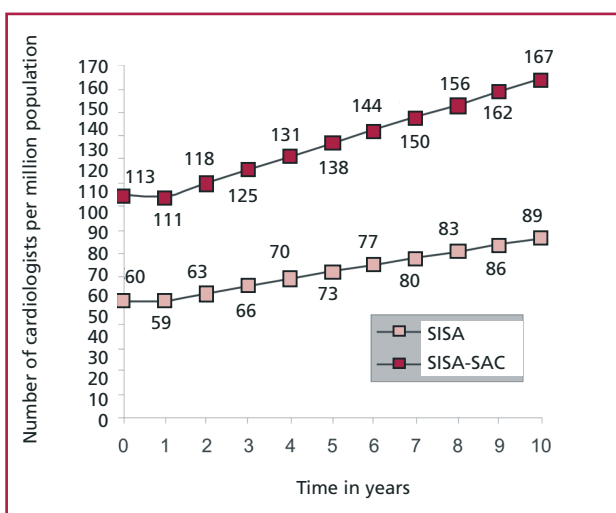


Fig. 3. Simulation to demonstrate the potential growth of the number of cardiologists per million population in Argentina over the next 10 years, according to the population evolution and baseline data from the SISA and SISA-SAC registries.

cardiologists per year, instead of 200.

CONCLUSIONS

Today, there are official data about the medical workforce in the different specialties, and it is not unreasonable that it will serve as platform to implement policies in the area of human resources. However, these data appear to be incomplete, and consequently all the scientific societies should help complement the information and correct the evident SISA under-reporting. In the case of cardiology, the comparison between SAC and SISA registries indicates that almost half the number of specialists is not included in the SISA database. If only the official data were considered, today –and probably in the future– we would have an appropriate

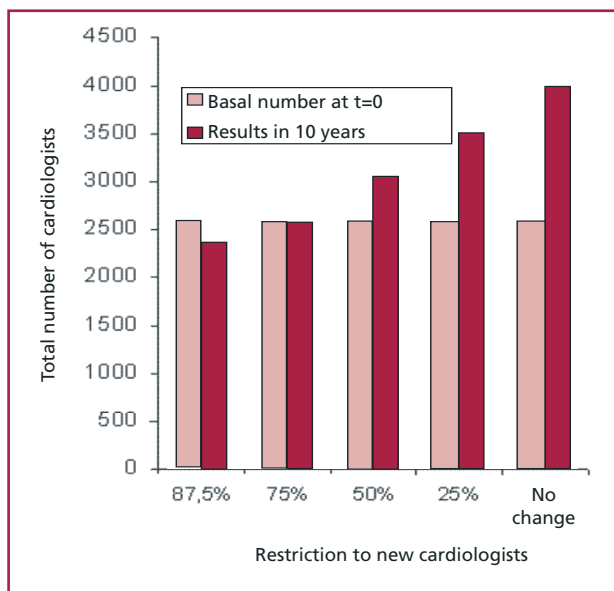


Fig. 4. Simulation to demonstrate the necessary level of restriction to incorporate new cardiologists over the next 10 years, in order to maintain the current number of cardiologists in Argentina (equivalent to 60 cardiologists per million population). The simulation was made only with the baseline SISA data; calculations with the SISA-SAC registry are different in absolute numbers but equivalent in relative values.

cardiologist-population ratio, but findings in the present study show that this ratio could be much higher indicating an overpopulation of specialists. If health policy decision-makers did not cautiously evaluate preliminary official information from SISA, or did not recognize its precariousness, we could fall into the fallacy of reasoning correctly from erroneous premises. Still, the SISA registry is a very good initiative, and all the scientific societies should collaborate to improve its validity and usefulness.

Conflicts of interest

None declared.

REFERENCES

1. Sklar DP. How many doctors will we need? A special issue on the physician workforce. *Acad Med* 2013;88:1785-7. <http://doi.org/sq9>
2. Iglehart JK. A new day dawns for workforce redesign. *Health Aff (Millwood)* 2013;32:1870. <http://doi.org/srb>
3. Borracci RA, Giorgi MA, Sokn F, Hauad S, Guardiani FM, Lowenstein DM et al. Estimation of the Supply and Demand for Cardiologists in Argentina. *Rev Argent Cardiol* 2009;77:21-6.
4. Abramzón MC. Argentina: Recursos Humanos en Salud 2004, OPS.
5. De Teresa Galván E, Alonso-Pulpón L, Barber P, Bover Freire R, Castro Beiras A, Cruz Fernández JM y cols. Imbalance between the supply and demand for cardiologists in Spain. Analysis of the current situation, future prospects, and possible solutions. *Rev Esp Cardiol* 2006;59:703-17. <http://doi.org/bcfzfw>
6. Block P, Petch MC, Letouzey JP. Manpower in cardiology in Europe. The Cardiology Monospecialty Section of the UEMS. *Eur Heart J* 2000;21:1135-40. <http://doi.org/btwcwgq>
7. Registered medical specialists. Absolute numbers and rate per 100,000 inhabitants Eurostat. Disponible en: <http://epp.eurostat.cec.eu.int>