

Research

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Reflexion about Pediatrics, Anesthesia and Education in Pediatric Anesthesia in Colombia and South America

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ABSTRACT

Latin America is a region with large changes in the last decade with the purpose of improving its political, economic, social and cultural situation. It must face a series of challenges to improve safety, health and education for people. This situation is no different in medical education and the way in which health systems operate in the region. The aim of this article is to reflect the global situation from the pediatric anesthesia perspective and to analyze important aspects as health, infant mortality, poverty and education opportunities in Latin America. After a thorough investigation to collect some statistics from this region, different web pages and official government websites were consulted to get a diagnosis of the situation of pediatrics and pediatric anesthesia in Colombia and South America; its challenges and the current projects from different countries with the goal to improve education and ensure better living conditions for children in this region of the world.

KEYWORDS: Children; Mortality; Education; Anesthesia; South America.

INTRODUCTION

Talking about pediatric anesthesia and education in Latin America implies analyzing the global situation of the region. The goal of this reflection is to describe the situation of pediatric anesthesia in Colombia and South America; to explain the current difficulties of the region and the challenges that we have to face to improve education in this field.

Background

Colombia is located in the northwest tip of South America. It has about 48 millions of inhabitants in an area of over seven hundred thousand square miles.¹

Nations in South America and The Caribbean have specific goals in order to improve the quality of life of the population (*the millennium goals*) those goals are: to reduce child mortality, to reduce hunger and poverty, to reach gender equality, and to improve access to education and to protect the environment and natural resources.²

Colombia has about 12 million of children under the age of 15 years, (25% of country population). In 2013, Colombia had almost 600.000 births, with a birth rate of 19 for 1.000 people.^{3,4} This rate is lower than the average of South America, but it is higher than in North America and Europe.⁵ (Figure 1)

The birth rate in the world has a tendency to decrease as the timeline advances. The same tendency occurs with child mortality, which has changed dramatically by regions in the

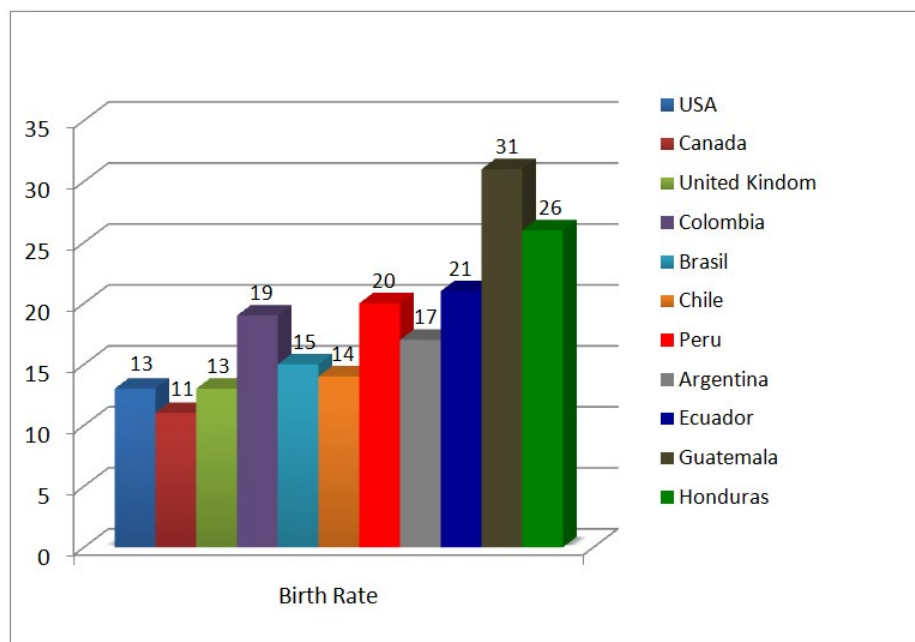


Figure 1: Birth rate of different countries in the world. Number per 1,000 inhabitants
Source: modified from <http://www.indexmundi.com/g/r.aspx?v=254>

last decade. Children mortality has declined in the last ten years by different reasons⁶: actions to improve mother's health, prenatal care programs and better conditions for mothers have been crucial to diminish mortality in babies under 1 year. But also, social policies as contraception programs in adolescents, massive vaccination in children and vulnerable population, better possibilities to attend school and the improvement of life conditions in the rural area, are some of the most important strategies to reduce mortality in children. However, the children mortality in Colombia is still high and the main causes of death in children still are malnutrition (13% of cases),⁶ perinatal afflictions, respiratory infections and accidents. This statistics are different among regions. Main cities (Bogota, Medellin) have the lowest mortality rate in the country (10-12/100.000) where people can have access to integral healthcare services and better opportunities to get education, but rural areas as Vaupés, Guainía, Choco and La Guajira have mortality rate as high as Africa (22-49/100.000)^{7,8,9} where population have the highest levels of poverty and forced displacement by violence and the access to health care is scarce.¹⁰ Poverty is directly related to mortality as well. Colombia has a poverty index of 34% and 10% of the population live in extreme poverty.¹¹ However, the problem is not only the poverty itself as the bad distribution of the wealth in the region.¹²

The mortality rate in children by regions in the world is showed in figure 2.¹³

The situation of pediatrics and anesthesia in the region

Colombia has 3.180 anesthesiologists to attend 48 mil-

lion of people with 12 million of children.^{3,14,15} Currently, there are 24 anesthesia programs in all the country that graduate about 120 new anesthesiologists per year. The time dedicated to pediatric anesthesia in three years of residence is between 2 to 5 months, which is not enough time to acquire a deep knowledge and skills in pediatrics.¹⁶ So far there are not pediatric anesthesia fellowships in Colombia.

This outlook is not different from other South American countries. Table 1 describes the number of anesthesiologists available in each country and its ratio with the number of inhabitants.

Although the number of anesthesiologist by inhabitants depends of every country, it is considered as a good relation to have about 1 anesthesiologist by 5.000 to 10.000 inhabitants,¹⁵ so there is a deficit of human resource in anesthesiology in the region.

The hospital infrastructure is insufficient as well. Colombia has only 11 pediatric hospitals in all territory. Many of them are not exclusively dedicated to pediatric patients, so most of the pediatric population receive healthcare in general hospitals.

The number of pediatric beds in Colombia is 10.642 with a ratio of about 1 bed per 1.1000 inhabitants in Colombia; although there is not an ideal number of beds, the World Health Organization recommends a number of 3-5 beds per 1.000 inhabitants.¹⁸

Under-five mortality rate by region, 1970-2011 (per 1,000 live births)

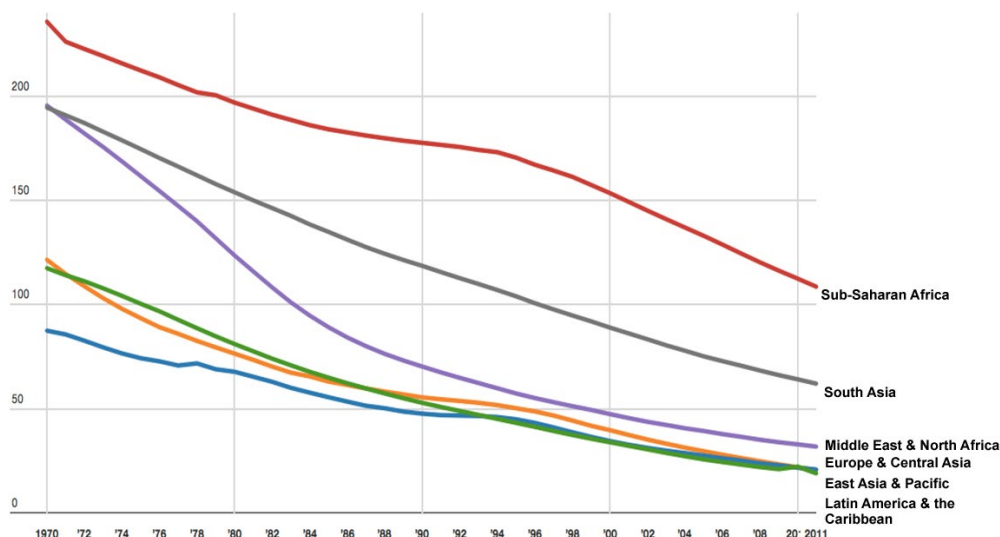


Figure 2: Children mortality rate in children under five years by regions in the world.
Source: <http://blogs.worldbank.org/opendata/node/544>

Country	Population	Number anesthesiologists	Ratio Anesthesiologist/inhabitant
Brazil	194.933.000	12.000	1/16.000
Mexico	120.000.000	12.000	1/10.000
Colombia	48.000.000	3.180	1/15.000
Argentina	40.900.000	3.800	1/10.000
Peru	29.277.736	600 ⁽¹⁹⁹⁵⁾	-
Venezuela	29.277.000	3.226	1/9.000
Chile	17.248.000	1.200	1/14.000
USA	300.000.000	35.000	1/8.500
United Kingdom	63.000.000	10.000	1/6.300

Table 1: Survey to members of anesthesiology societies in South America. Dates modified from Calabrese D. clasa-anestesia.org¹⁷

Again, the problem is not only about the number as the geographical distribution, because there are regions in the country where pediatric hospitals are not available. (Figure 3)

A similar situation occurs with Pediatric Intensive Care Units (PICUs) that are available in the country to attend critically ill children. There are 115 PICUs with 870 beds. It means a ratio of 1 bed per 14.000 children; and it is even worse in some countries of South America and the Caribbean, where the ratio is 1 PICU bed per 40.000 inhabitants.¹⁹ The difference is huge compared to some high-income countries: United States has 21.000 PICU beds,²⁰ (1 PICU bed per 3700 children) or Germany, 1 PICU per 4.000 children.^{21,22}

Again, the human resource is limited in Colombia because only 49% of these units have a pediatric intensivist and it could be one of the reasons why the mortality in PICUs in Colombia and Latin America is higher than other regions in the world (13% in Latin America vs. 5% in Europe).¹⁹ The distribution of these PICUs is focused in the central area of the country and some regions lack of PICU beds. (Figure 3)

In summary, Colombia and Latina America has a real deficit of human resources, hospital infrastructure and technology, but the most serious problem, is the bad distribution of health resources by regions.

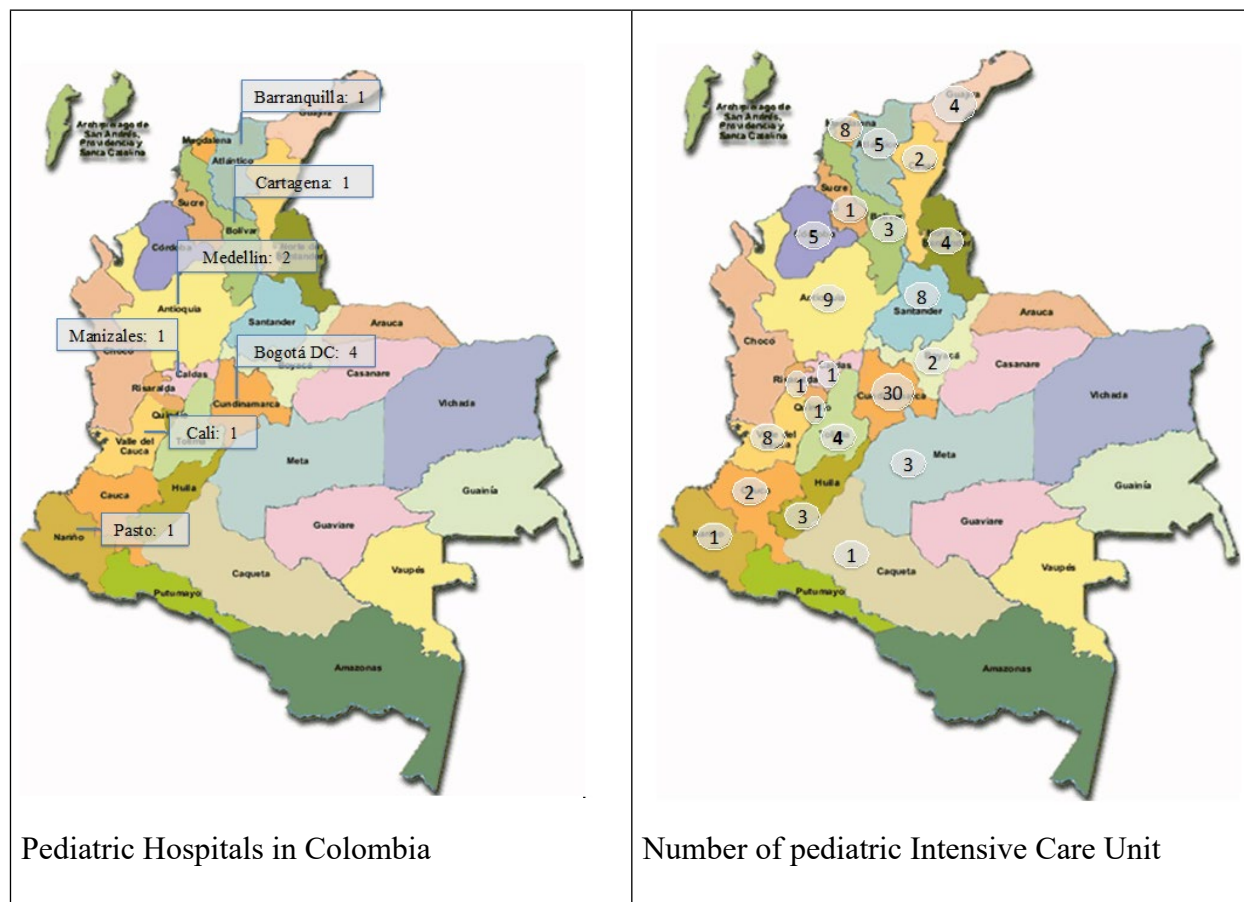


Figure 3: Distribution of the pediatric hospitals in the country (right) and number of PICU in Colombia (left). Source: The author.

Pediatric Anesthesia

Colombia has about 80 anesthesiologists who have dedicated their professional life to work with children in pediatric hospitals. Also, there are six anesthesiologists trained in pediatric anesthesia by The Colombian Society of Anesthesia (2003 to 2009); and there are about twenty anesthesiologists in Colombia who have done a fellowship abroad. In summary there is about one hundred pediatric anesthesiologists to attend children in all the country.

The possibilities to apply for a pediatric anesthesia fellowship in Latin America are limited. There are five programs in Latin America: Mexico, Venezuela, Argentina, Costa Rica and a special training program in Chile accredited by the World Federation of Societies of Anesthesiology (WFSA).^{23,24} (Figure 4)

In synthesis, Colombia and South America have a deficit of human resources in pediatric anesthesia. It is difficult and expensive to bring them from abroad and although it is a challenge to create new fellowships programs in the region, some countries are currently working to get their own programs. However it is essential to have specialized staff due to the consider-

able number of children in Latin America (about 117 million of children),²⁵ the complexity of pathologies in childhood and to improve safety in children's health care. Besides, to guarantee skills and knowledge in pediatrics patients, anesthesiologists should receive an additional training to decrease perioperative complications.^{26,27}

The future direction of pediatric anesthesia in the region

There are some projects that anesthesiology societies in South America have developed to improve knowledge, safety and training in pediatric anesthesia. The most important is the program of continued education, which integrates a number of local meetings, workshops and national congress with the cooperation of different countries, publications in local and international journals, and the new editions of books of pediatric anesthesia in Spanish made with the cooperation of American authors who have excelled in this field.²⁸ Also there is a virtual platform to extend education programs through e-learning module created by Colombian Society of Anesthesiology which is available for South America and the Caribbean.²⁹

And finally, Colombia, Chile and Brazil are working

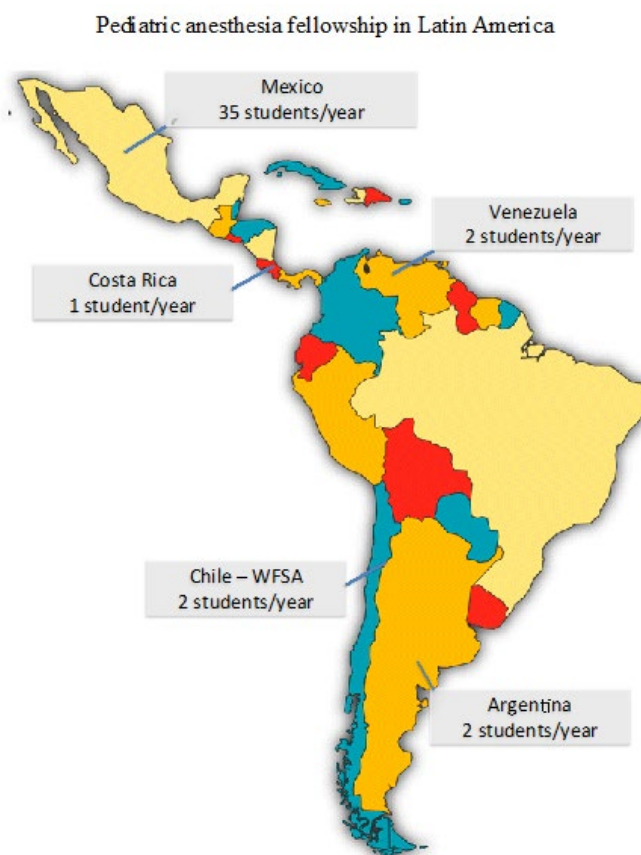


Figure 4: Countries that currently have fellowship programs in pediatric anesthesia in Latin America and the number of fellowships available by programs in each country. Source: The author.

to create their own fellowships in pediatric anesthesia to train anesthesiologists from the region in pediatric hospitals and teach them the basic principles of good practice, safety and promote investigation in the area of pediatrics.^{16,30}

CONCLUSION

Colombia and South America are facing a lot of challenges, but the main change is changing minds. This goal is only possible through education.

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ETHICAL ISSUES

This paper does not compromise any institution or people. It has made with general information available for general audience published by different entities and government official websites in the region.

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