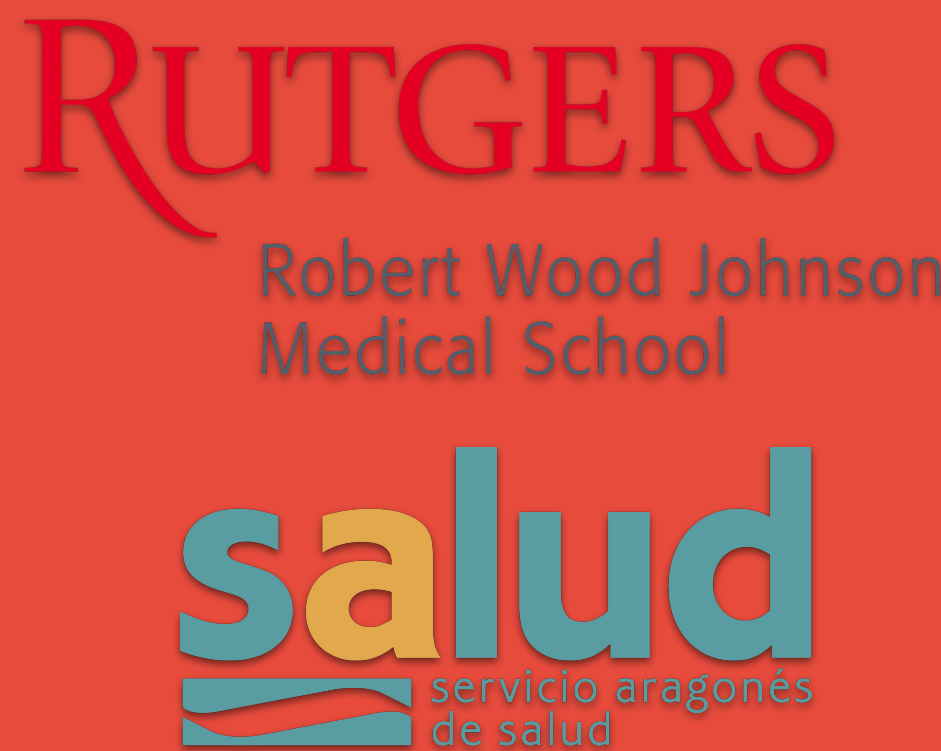


Navigating the Pulse of Spain's Health: Insights from Zaragoza



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Abstract

Zaragoza, Spain.
A dry-heatwave, culturally rich, bustling city with \$2 cafe con leche at every corner, magnificent medieval-century castles, and crowded outdoor markets. Welcome to the capital of Aragon.
For four weeks, myself and two other RWJMS global exchange students learned the calles (roads) and restaurants like the back of our hands, interacted with the patients and doctors in Zaragoza’s health centers, and called the city home. During these weeks, we learned what it meant to be fully immersed in the culture, people, and health system of Spain.

Spain’s health system (Sistema Nacional de Salud) is unique – it is one of the top-ranking countries in terms of life expectancy rates, and has one of the most successful decentralized public health systems globally. However, with its successes come a separate set of challenges. Due to higher average life spans, Spain struggles to service a growing aging population. Also the pressures of a universal system exacerbate some aspects of healthcare burnout amidst limited resources. Finally, finding ways to improve access in rural health settings largely defines national healthcare outcomes, as nearly 20% of the population resides in Spanish villages nestled between the Catalan and Pyrenees mountains. Overall, these challenges necessitate dynamic adaptations in order continue to meet the needs of a dynamic healthcare landscape.

The goal of this project is to explore specific strengths and challenges within Spain’s public health system, informed by my observations during my 4 week period shadowing in Zaragoza’s health centers and hospitals. First, I will outline the structure of Spain's health system. Second, I will identify how this system places positive and negative pressures on cardiovascular health. Lastly, I will address the significant role rural health plays in health outcomes in Spain. Overall, I hope to elucidate issues that require continued development – particularly within cardiology and rural health settings – for the continued integrity of the Sistema Nacional de Salud.

Introduction

Spain’s healthcare system (Sistema Nacional de Salud) is a universal system characterized by decentralization of responsibilities and power. This transfer of responsibilities is divided among 17 regions called autonomous communities, each with its own government and healthcare. Today, each region of the country has different healthcare expenditure public policies financed through taxes [6], which get distributed to regions according to the a) amount of aging population in that region, and b) the insularity of that region. Altogether, Sistema Nacional de Salud provides comprehensive hospital, ambulatory, and primary healthcare services free of charge. It has resulted in Spain’s top global ranking by the World Health Organization – 6th out of 89 countries in overall healthcare according to the 2023 Health Care Index.

When first introduced to their regional allocation of responsibilities, I observed the cultural development of notable (sense of -suggestion to delete so there’s less words) loyalty between patients and primary care providers. Because doctors are assigned patients according to geographic region or city, several doctors I met indicated a sense of ownership and public responsibility over their respective region. Additionally, because patient-doctor assignments often do not change over a lifetime, longitudinal care is a natural outcome. This has lead to marked increases in consistent follow-up over time.

However, with these benefits, Sistema Nacional de Salud still faces several challenges. As a result of longer life expectancies, Spain also has a notable aging problem [3] which is only anticipated to grow over time. By 2035, 26.5% of the total population will be aged 65 and over. As this aging population continues to grow, health services are required to tackle increasingly age-related and chronic pathologies.

Cardiovascular health defines a large portion of the aging population mortality – accounting for ≈120 000 deaths per year, or 1 in 4 deaths in men and one-third of deaths in women [2]. The Global Burden of Disease project estimated 431,600 new diagnoses of cardiovascular disease in Spain in 2015, a year with 592,000 cardiovascular disease hospital admissions. In another report, the 2014 WHO Report, cardiovascular diseases are responsible for 37% of deaths of people under 70 years of age [3].

Additionally, rural health proves a challenge as a large portion of the aging population resides in rural villages of Spain’s mountain ranges. A complex system of weekly “on-call” requirements; delegated among residents and doctors, allows surveillance and care of the many elderly in Spain’s rural areas. However, in many cases of urgent and emergent healthcare issues, transport of over an hour may be required to deliver a patient to the nearest hospital equipped to deal with the issue.

Cardiology in Sistema Nacional de Salud

Due to the major burden of cardiovascular disease on Spain’s population, I decided to shadow in 3 cardiology units of Zaragoza – interventional cardiology, arrhythmia cardiology, and pediatric cardiology. Within these units, several challenges of the Sistema Nacional de Salud came to surface through patient interactions. Of these challenges was primarily issues with unstandardized electronic health record systems, and with overwhelming patient burden on the system.

The first challenge I documented in Spain’s universal health system was the need for standardized electronic health record systems. This problem presented itself in several patient cases – from stenotic cases to myocardial infarctions – but the most notable belonged to a patient I met, age 65, that had been admitted to the ED due to a cardiac syncope. He had been diagnosed with aortic stenosis (I was even able to auscultate it on examination!) but he resided in a different region of Spain than Zaragoza. His primary care doctor, assigned Centro de Salud (health center), and regular hospital were all in that other region of Spain. Unfortunately, his bout of syncope occurred while he was in Zaragoza on travel. As a result, several of his medical records were not accessible from our Zaragoza hospital. We were not able to process the patient as quickly, or assess the patient history, unmemorable medications, and history of care. All of this was important information for informing our assessment and plan. The doctor I was shadowing shook his head, expressing his frustration with this – “esto ocurre mucho...” – this happens often.

This issue is well documented. Though electronic health record systems have been developed and implemented across Spain, there are often interoperational problems, limiting communication among and within regions. This frequently impacts and between levels of care, and “hamper the collection of statistics, security surveillance, and automatic benchmarking” [2]. And, as I saw while shadowing in the hospital, when doctors require additional information to make decisions, this delays processing time.

A separate problem in a few of the cases I observed was the impact of patient overload on clinical decision making. On more than one occasion, cardiologists had to dispute for surgery in order for a patient to receive proper care. Some patients with critical issues were blatantly rejected from neighboring hospitals due to patient overload. In one case I observed, this resulted in rejection of a surgery with emergent nature. This was completely outside of the doctor’s control. Spain’s health system is chronically overloaded – in Spain there are 7.5 visits per capita per year, compared to Sweden’s rate of 2.9 visits per year [1]. Healthcare workers also are historically underfunded, as a result of austerity measures introduced during the 2008 financial crisis [6]. This may result a chronic issue of depressed but preventable cardiological healthcare outcomes, should better systems be in place

In all, despite its many strengths, Spain’s public health system does also possess obstacles for patients receiving care – particularly for patients with cardiovascular disease.

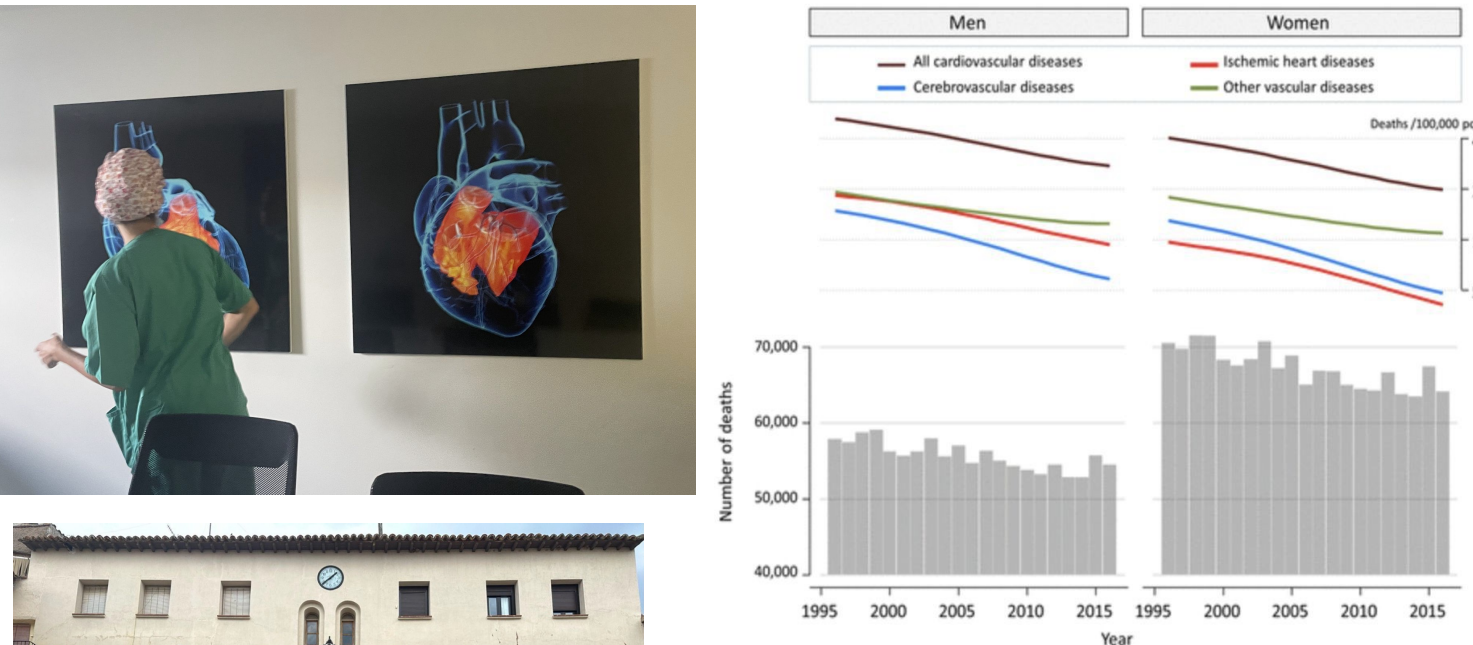


Figure 1. Temporal trends in numbers of deaths and age-standardized mortality rates* for cardiovascular diseases in Spain, 1996 to 2016. Source: Department of Epidemiology of Chronic Diseases, National Center for Epidemiology (ISCIII).

Rural Health in Spain’s Healthcare Outcomes

So, how is specialized healthcare managed in Spain’s many villages, when the nearest hospital may be an hour away? In 2019, 21 % of Spain’s men and 19% of Spain’s women were represented as residents in rural areas [9].

For issues like cardiovascular mortality due to coronary heart disease or stroke, outcomes are closely related to the speed at which patients receive specialized care. It has been noted that living in rural areas of the Catalanian region increases the risk of cardiovascular mortality [10]. As a result, there are well-being inequalities across regions, partially dependent on rural versus urban environment.

In one particular instance, I was on overnight on-call for a set of 7 Villages. A man arrived to the clinic with a pain in his lower back, and an inability to urinate. He noted chills, fever, and nausea. It took much effort to move him onto the examination table due to the degree of pain he felt in his lower back and abdomen. We quickly performed a strip test on his urine for blood or protein – but he was barely able to urinate a sufficient quantity, and we were not able to get consistent results on the test trip.

My immediate thoughts were that this was a classic case of pyelonephritis. His fever indicated something more than a kidney stone, and his increasing pain felt to be of emergent nature to me. There was no way for us to tell anything from the paper strip in our small examination room, and there was no way to CT or ultrasound in this small clinic, if the goal was to rule a kidney stone out. With pyelonephritis, timely diagnosis is critical - as the illness can be life threatening. In my eyes, it would be best to err on the side of caution – to send the man to the closest hospital ED.

However, rather than sending the patient directly to the emergency room, the doctor puzzled at the paper strip for a long time before looking up, defeated. “I am going to write you a prescription,” she said. “Come back if this continues to get worse.” The patient took the paper script, and hobbled out of the room.

As he left the room, I was left with a feeling of lacking – there had to be more we could do. The man left with a script for an antibiotic that he would have to drive to a separate village, over 40 minutes away to receive. He was barely in a condition to walk properly. But because village pharmacies opened on a pre-scheduled basis, each a few times a week – this was the only option. I wondered if the infection would reach his bloodstream, or if his kidney would scar in this time.

As I turned to the resident next to me, she shook her head – “I did not like this one.” she said in broken English. “I did not agree with that.” But the closest hospital was an hour away, rather than being ruled in it was ruled out.

Undertriage is notably more common in rural settings. It has been well cited and documented that the lack of rural trauma and specialized centers is often a risk factor for rural patients [4]. Provider and system interventions may help reduce this problem in rural settings. Additionally, between the years of 2003 and 2019, rural areas have shown the least reduction in avoidable mortality and mortality from all causes of death. Deaths in rural areas represented 24% in 2003 and 23 % in 2019, while in women those figures were 23% and 20% respectively [9]. Altogether, rural health continues to be a challenge, necessitating revised policy or access measures for the rural patients. Particularly in patients needing specialty care, rurality may contribute to mortality.

Sex and residence area	Population		Avoidable causes of death		All other causes of death	
	2003	2019	2003	2019	2003	2019
Men						
Large urban areas	8,370,300	8,796,674	10,128	6923	29,383	23,905
Small urban areas	6,939,195	8,100,072	7564	6347	22,528	21,873
Rural areas	4,498,596	4,379,147	5731	3855	16,312	13,532
Women						
Large urban areas	8,672,609	9,217,539	7038	5207	12,003	11,798
Small urban areas	6,781,432	8,005,920	5169	4348	8664	9478
Rural areas	4,194,734	4,044,298	3677	2381	6,212	5,050

Table 1. Population and deaths from avoidable causes and from all other causes of death in those under 75 years, according to area of residence. Spain, 2003 and 2019

Conclusion

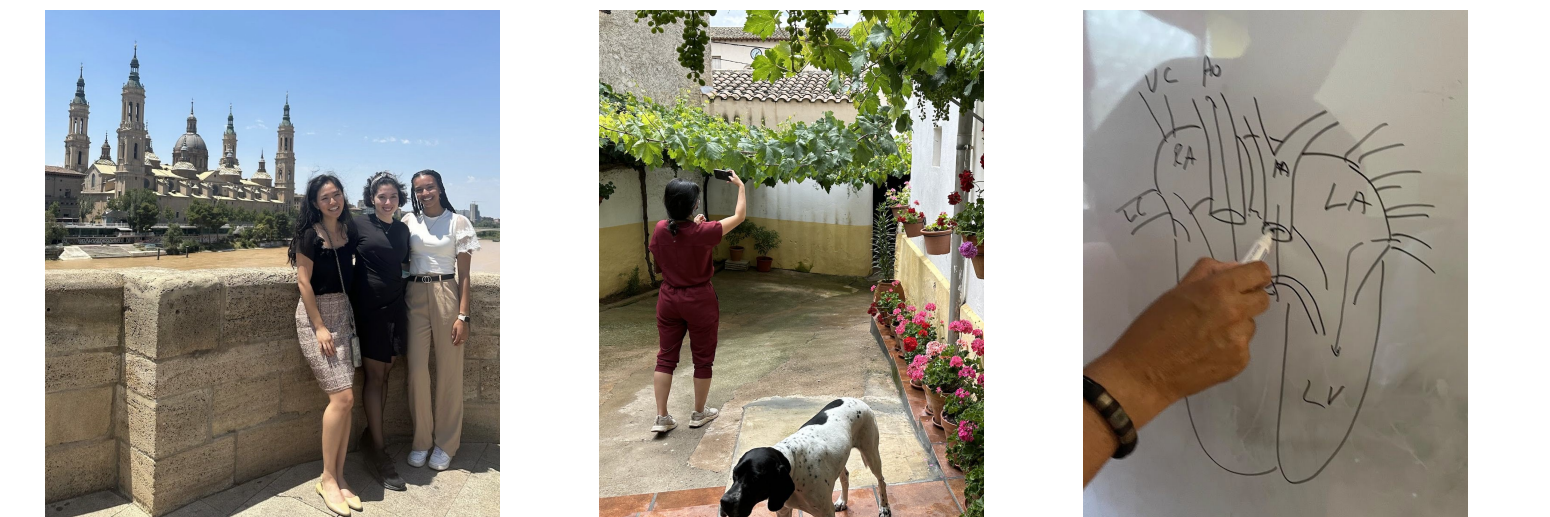
In conclusion, my immersive exploration within Spain's Sistema Nacional de Salud has illuminated both the strengths and challenges inherent in this decentralized universal healthcare system. The observed delivery of healthcare services at various Centros de Salud and hospitals showcased a system deeply committed to universal access but facing significant hurdles.

Within the region-based autonomous government system, the need for standardized electronic health records emerged as a prominent issue, causing delays in critical cardiac treatments. This exhibited itself in several patient cases ranging from myocardial infarction, to valve stenosis. Additionally, the struggle for access to surgery for patients across hospital systems underscored the systemic overload experienced by healthcare providers.

The disparities in healthcare access and treatment between urban and rural areas also highlight a pressing concern, particularly regarding cardiovascular care. These disparities in rural healthcare access and undertriage magnify the urgency to address these regional discrepancies in medical practitioner decisionmaking. Enhancing the speed and effectiveness of specialized care delivery in remote areas is pivotal to mitigating health outcome inequalities.

Despite these challenges, Spain's healthcare system has garnered global recognition, earning a commendable position in the World Health Organization's ranking. However, there remains a crucial need to address the systemic issues identified in order to sustain and further improve its overall healthcare quality.

Moving forward, prioritizing the implementation of standardized electronic health record systems, alleviating patient overload, and devising strategies for enhancing rural healthcare accessibility are imperative steps towards ensuring equitable healthcare outcomes for all within Spain's Sistema Nacional de Salud. Changes may include a policy for standardized EMR access, incentives for specialists to locate in rural areas, or funding towards advanced but cost effective scanning equipment in low access settings (i.e. mini-ultrasounds). Altogether, innovation in technology, policy, and systems are all required to improve health outcomes – not just for the individual patient cases highlighted from Zaragoza, but for the Spanish population as a whole.



Acknowledgements

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