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Refocusing cataract surgery through an interdisciplinary lens: A case study of Spain, Cuba, and Guatemala

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I. Introduction

Cataracts as disease of focus: a relevant public health challenge and a vector for interdisciplinary commentary

Do we not always find the diseases of the populace traceable to defects in society?

Rudolph Virchow¹

Relevance

Poverty is traditionally associated with low life expectancy and, as a result, senior pathologies are commonly thought of as “first-world” problems. However, the tremendous efforts towards public health, including vaccines, access to clean drinking water, and affordable medications, have increased life expectancy at a truly global level, in developed and developing countries alike. Increased dedication to health and longer life expectancy worldwide has given birth to a new demographic landscape, under which there are large elderly populations in both wealthy and impoverished countries. As Alexandra Sontag noted in her report at Tufts Medical School regarding the major improvements in public health of the last century, “These advances by themselves should have warranted a lifting of many populations out of poverty-but this has not entirely occurred. What has indeed happened is an increase in the number of individuals surviving for a longer period of time- in essence ... a greater number of people becom[ing] old.” (Sontag 2009). Two thirds of these individuals can be found in developing countries and many continue to face poverty and marginalization (Sontag 2009).

Because of this revolution in lifespan, and a correspondingly wide-scale impoverished older adult demographic, the public health sector is now engaging in new conversations about what defines “primary healthcare” and is questioning the traditional age-restrictions imposed on this concept. For those who consider health a human right, primary healthcare is the minimum, basic healthcare which should be universally available throughout an individual’s life. Until recently, many of the organizations which promote primary healthcare, such as the WHO (World

¹ Considered a founder of “modern pathology” and “social medicine” (Encyclopedia Britannica, 2012).

Health Organization), have not included interventions for the elderly. However, given the recent growth of this population, these organizations are expanding their definitions of primary healthcare to include prophylaxis for senior diseases. To enrich this dialogue, our gaze should shift towards senior pathologies and which of these can be integrated into the primary healthcare framework. A variety of conditions comprise senior pathologies, and many of these are subject to the life history of the individual, making it difficult to identify the type of universally beneficial interventions that characterize primary healthcare (such as vaccines). Nevertheless, we can still identify a small number of age specific albeit universally physiological conditions, and cataracts are among these. Cataracts are an inevitable and integral part of the aging process, and thus distinguish themselves as a not only a common disease of the senior demographic, but also as a defining feature of this age group (Arteaga, 2012).

Medically, cataracts are a “clouding of the lens of the eye which impedes the passage of light” (WHO, 2011) (Image 1).

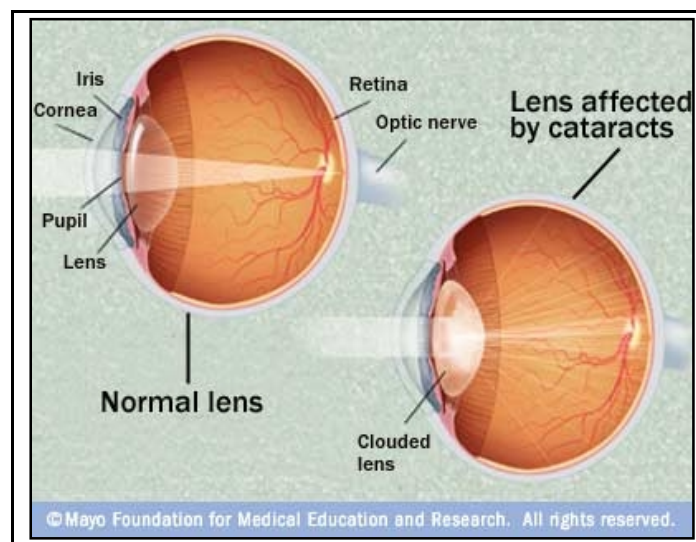


Image 1. A normal lens versus a lens with cataracts. Source: Penn Medicine, 2011

The lens becomes opaque when the proteins that structure the tissue denaturalize and conglomerate. This conglomeration disperses light as it passes through the lens (rather than refract and focus it), which makes it difficult to form a focused image. The causes for this denaturalization and conglomeration are diverse and can include penetrating trauma to the eye, diabetes, and congenital conditions. However, a “senile” cataract, which occurs as a natural

result of aging, by processes not entirely understood, is the most commonly occurring type of cataract by a large margin (Aguilar 2010) (see annexes for a more detailed description).

Incidence

In the mid 1990's the scientific community recognized that the burden of global blindness would double by 2020 if its contributing pathologies continued to develop at their current rate, due in part to the fact that senior demographics were growing at significant rates in developing countries (Thylefors, 1998) (**Fig. 1**).

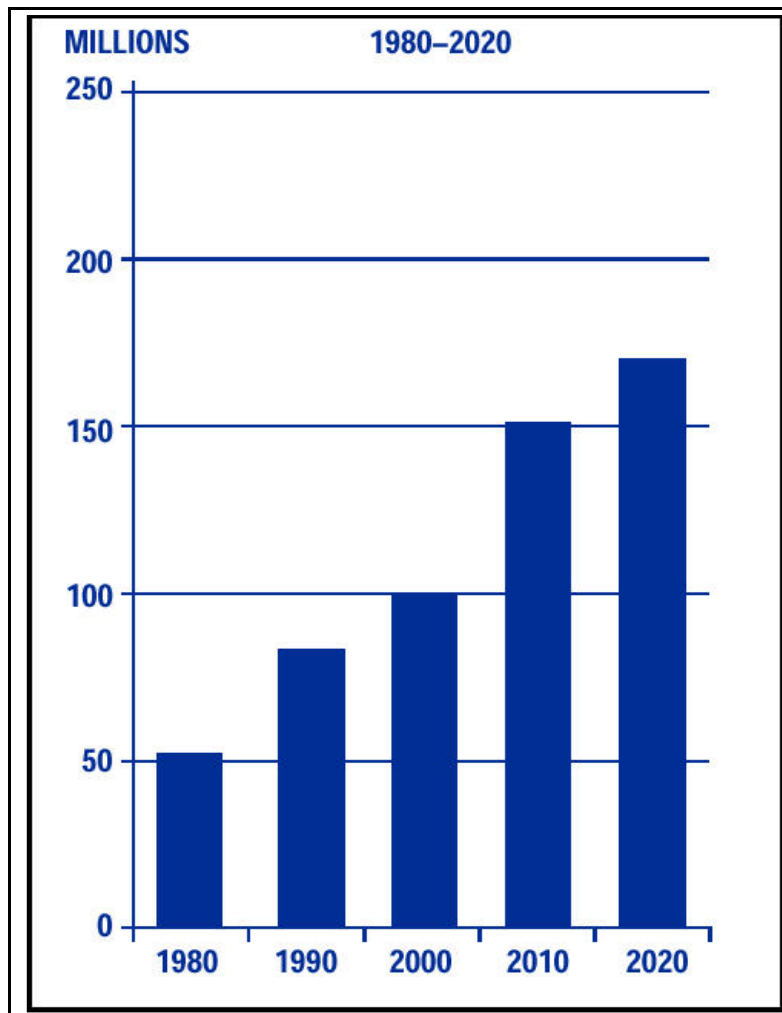


Figure 1. WHO Estimates of population blinded bilaterally by cataracts per year. Source: WHO 2000

The number of people blind from cataracts in the world is increasing by approximately 1 million per year and the number of ‘operable’ cataracts² is increasing by 4–5 million per year (Vision 2020, 2000). All cataracts, whether considered mature enough for operation or not, are major contributors to disability. Because of the link between cataract and disability, in addition to the rapid increase in prevalence, cataracts have been identified as one of the newest yet most pressing public health concerns (Vision 2020, 2000; Weller, Trenton, Robert, 2007).

Global Burden

There have been numerous studies which try to quantify exactly how burdensome cataract-caused blindness really is. This quantification is a challenging task for several factors relating to both the disease itself and the methods available for measurement. Although there exist standards for “visual acuity” and “blindness”, it is difficult to quantify when a cataract becomes disabling for the individual. Many biomedical facilities have discrete criteria ophthalmologists follow as they decide whether or not to recommend surgery to a patient (such as visual acuity, or where the cataract is located in the lens), but the degree to which limited vision is disabling is highly subjective. Regarding surgery, a recent publication from the *Sociedad Oftalmologica de España* (Spanish Ophthalmological Society) stated:

Se acepta que los criterios basados sólo en medidas de la agudeza visual son inadecuados para determinar el momento apropiado o la necesidad de la intervención quirúrgica y que, junto a los hallazgos del examen oftalmológico, la decisión debería basarse en el grado de satisfacción del paciente con su función visual. Los requerimientos visuales entre los ancianos son diferentes y el motivo principal no debería ser el grado de opacificación del cristalino, sino su interferencia con el estilo de vida y su repercusión en el funcionamiento diario (López-Torres, López-Verdejo, Otero-Puime, et al. 2004).³

Accordingly, there exists no concrete measure to define when a cataract surgery is called for. Rather, cataract surgery is provided based on how disabling the patient finds her vision loss. This is to say, different levels of visual acuity are variably restrictive to patients according to their lifestyles and the personal value they vest in their vision. To that end, there exist no concrete

² A visual acuity of 6/60, a common threshold for which doctors recommend operation (Vision 2020, 2000).

³ Our translation: “Visual acuity as sole criteria for determining the right time or the need for a surgical intervention is inappropriate. In addition to the findings of the ophthalmologic exam, the decision to operate should be based on the degree of satisfaction of the patient with her visual capabilities. The visual requirements of the senior population are different for each individual and the principal motivation for operation should not be just the degree of opacification of the crystalline lens, but rather the repercussions it has upon the patient's daily life.”

criteria of visual acuity that can quantify exactly how disabling different stages of cataract development are to the individual. Consequently, the burden of cataracts tends to be quantified only after they render the patient blind, which factors out people who may find themselves disabled by cataracts but are not entirely blind. Because of all of the ambiguities surrounding how and when to define disability, the data available on the global burden of cataracts are limited in their scope.

However, despite the difficulties in evaluating the disability associated with cataracts, studies have still found a concrete global burden of cataracts. In particular, there exists a recognized association between cataracts (as the leading contributor to blindness in the world) and development where, “poverty and blindness are believed to be intimately linked, with poverty predisposing to blindness, and blindness exacerbating poverty by limiting employment opportunities” (Kuper, Polack, Wanjiku, et al. 2011). The data available on the burden of cataracts have found that they account for the loss of at least 17.7 million Disability Adjusted Life Years a year⁴ and the cost the global economy roughly 80 billion USD in loss of productivity (Yoshimune et. al 2010; Unite for Sight 2020). These economic losses can be accounted for by the disabling nature of cataracts, but also by the implications a blind family member has upon the household economy (Frick and Foster, 2003). Therefore, there exists a tangible link between cataract caused blindness and development. The economic and developmental consequences of blindness are a major component of the burden of cataracts, and part of why the disease has come to the forefront of international aid and research in the last 20 years. Accordingly, the global burden of cataracts, although difficult to quantify, is a compelling force behind the international effort to learn more about the disease and to promote cataract surgery.

An interdisciplinary problem

Because of the global burdens of cataracts, and their increasing prevalence, cataracts have been identified as “major public health challenge of the 21st century” (Peláez, 2005). In essence, as a highly relevant health topic, medically as well as socially, cataracts merit further research and investigation. In fact, dozens of studies looking at cataract caused blindness in settings across the globe have called for more research regarding this disease (Jefferis, Bowman, Hassan,

⁴ Number of productive years lost due to ill-health

et al. 2008; Gupta and Murthy 1995; Shrestha, Thakur, Gurung, et al., 2004). However, collectively, these studies have not called for more traditionally scientific research. To the contrary, they have called for research which examines why there have been so many problems with “uptake in surgery” in developing settings. From Tanzania, to China, to India, to Peru, studies have found a widespread inconsistency between the availability of cataract surgery and patient willingness to operate. Recent research from ophthalmologists in Nepal found that even after providing free cataract surgery and transportation, there was still widespread resistance to the intervention, concluding that “medical practice needs to develop a more holistic understanding of the needs of the communities, cultivating a greater capability to analyse the role of cultural, social, and economic factors when planning medical services for the population” (Snelligan, Shrestha, and Gharti 1998).

The need for an analysis of cultural, social, and economic factors when planning medical services is consistent with the very personal relationship an individual maintains with her ability to see. As a sense which is axiomatic to perception of reality, interventions related to sight often can invoke anxieties which may be cultural, social, and economic in nature. Accordingly, cataracts surgery is an intervention which needs to be considered from multiple standpoints. Although a strictly scientific analysis of cataract surgery points to important trends, at times the scientific discourse is limited in its ability to analyze what is at stake for the individual. As an example of how a strictly scientific discourse may escape important aspects of cataract surgery, we consider Table 1, which researchers in Spain used to evaluate the degree to which cataract surgery improved quality of life.

Subescala	Actividad
Conducción nocturna	— Conducir durante la noche
	— Ver objetos en movimiento (vehículos u otras personas) al conducir de noche
	— Ver las luces de los vehículos o de la calle al conducir de noche
	— Leer los letreros de la calle por la noche
Conducción diurna	— Conducir durante el día
	— Conducir por lugares desconocidos
Visión de lejos	— Leer los letreros de la calle durante el día
	— Leer los letreros de la calle por la noche
	— Leer los letreros de la calle durante el día
	— Usar transportes públicos
	— Caminar durante el día
Visión de cerca	— Caminar al atardecer
	— Ver la televisión
	— Leer los periódicos
	— Leer los prospectos de las medicinas
	— Leer los ingredientes de los alimentos enlatados
	— Firmar cheques u otros documentos
	— Enhebrar una aguja
	— Utilizar un metro o regla
	— Utilizar un destornillador
	— Preparar comida
Deslumbramiento	— Jugar a las cartas
	— Ver las luces de los vehículos o de la calle al conducir de noche
	— Ver las caras de la gente en un día soleado
	— Leer números en la pantalla del televisor
	— Jugar a las cartas

Figure 2. The Activities of Daily Vision Scale (ADVS). Source: López-Torres, López-Verdejo, Otero-Puime, et al. 2004⁵

The measurements in this table are important, and they represent a universally accessible way to understand cataracts, specifically what functions patients can carry out before or after surgery. As Table 1 shows, quality of vision is associated with a wide range of daily tasks and intimately related to mobility and independence. But equally as important as what is listed in the table, is what is not listed in the table: what is not quantifiable- for example, the joy derived from seeing colors. In observing post-operative consultations for cataract surgery in a clinic in Madrid, I

⁵ Our translation: “On the left hand column are different categories related to vision quality in the following order: nighttime driving, daytime driving, far sight vision, near sight vision, and glare. On the left hand column are different activities related to each category in the following order: the ability to drive at night, to see moving objects (vehicles or people), to see cars lights or street lights when driving, to read street signs at night, to drive during the day, to drive in unfamiliar areas, to read street signs during the day, to use public transportation, to walk during the day, to walk during the sunset, to watch TV, to read the newspaper, to read the prospectus on medications, to read ingredients on a can, to sign checks or other documents, to thread a needle, to use a ruler, to use a screwdriver, to prepare food, play cards, to see carlights during nighttime driving, to see people's faces on sunny days, to read numbers on a television screen, to play cards.”

found that the ability to see colors, in particular- blue, was the first difference patients perceived. Patients appeared to delight in being able to see the sky and the colors of their worlds more vibrantly and richly. Indeed, dating back to Freud and the coining of the term “scopophilia”, true pleasure can be perceived in the very act of looking and of seeing, something which is ultimately difficult to quantify and qualify in a scientific study (Mulvey, 1975) .

Furthermore, when seniors are faced with vision loss and compelled to evaluate their vision versus a biomedical, surgical intervention, it can incite anxiety about money, medicine, and mortality. As a result, the individual burden of cataracts is a space rich with personal meanings and these meanings cannot always fit into a traditional scientific discourse. The multiple anxieties around surgery are difficult to describe in the traditional scientific arena, using the host conventions we use to define “significance”. Indeed, this personal meaning is so intimate, that the scientific community has evaded defining “visual acuity”, or the appropriate time for operation for a patient.

Because of phenomenon such as these, as the medical community tries to understand the ethos of cataracts, the relationship between the individual and her sight should always be considered. This relationship is part of what makes an analysis of cultural, economic, and social factors an important piece of evaluating cataract surgery. As previous studies have determined, there is a need for a more holistic examination of cataract surgery: one that includes an analysis of the many forces at work which play into people's relationship with intervention.

Methodology

To that end, this study employs an interdisciplinary approach to the study of cataracts. In addition to synthesizing and analyzing scientific data on cataracts; cultural, social, and economic trends are drawn upon in order to learn more about how and why cataracts affect people differently in the three countries examined. Specifically in this thesis the following genres were used in order to analyze cataract surgery: historical texts, patient testimonials, anthropological ethnographies, demographic data, public health studies, newspaper articles, and ophthalmological research papers. Therefore multiple disciplines, including anthropology, history, economics, demography, and ophthalmology were drawn upon to investigate cataract surgery. However, more broadly speaking, cultural studies and public health are the two-overarching disciplines which guide this thesis and encapsulate most of the genres listed above.

Accordingly, when considering a specific aspect of cataract surgery, like public awareness of the procedure, various disciplines are invoked as a way to explain and explore that aspect. For example, instead of just considering the scientific data reporting public awareness of the cataract surgery the historical and cultural trends that may be related to public awareness are also considered. In this way, interdisciplinary resources are used inductively to consider what larger trends in society may be reflected in a given feature of cataract surgery. They also allow cataract surgery to serve deductively as a way to learn more about society. Instead of considering the intervention as isolated medical procedure, we use it as a platform for commentary about broader sociological dynamics of the setting. Interdisciplinary conversation can be used both as a way to explain why a given pattern may be observed regarding medical procedures, and also as a way to explain what the pattern of a given medical procedure may say about the society in which it exists. This two-way, inductive-deductive, dialogue between a specific medical intervention and society is part of what makes interdisciplinary commentary so important. By recognizing the links between a medical procedure and society, medical procedures can be improved and issues of “uptake” can be addressed in a more holistic, and perhaps more accurate, way.

More specifically, cataract surgery is explored by following a similar format for the three countries examined. We begin with an exposition of health and healthcare in each setting, considering how the current healthcare system evolved, the framework and structure of the system, and what overarching trends seem to be at work. We then consider how cataract surgery fits into these trends and histories. In each setting, we find that cataract surgery gives a more in-depth and concrete example of broader trends regarding health, showing the links between the intervention and society. Finally, we analyze why cataract surgery is so important for each country. We look at how cataract surgery (or lack thereof) is affecting the population and how it will become increasingly important for each country in the future.

Country Comparison

In our increasingly globalized and interdependent age, it is impractical to consider any society in isolation. In particular, for healthcare challenges, such as cataract surgery, it is not only impractical but also unproductive to analyze health issues separately from the societal and global climate in which they exist. In order to foster a well-informed and effective dialogue about how to improve healthcare- policy makers, healthcare organizations, and individuals should consider

the examples and practices of other systems. Ideally, these conversations should take place for all healthcare issues, but for this study, the scope of the analysis is limited to one particularly relevant and novel healthcare challenge- the need to expand cataract surgery.

Cuba, Guatemala, and Spain share linguistic, cultural, historical, and economic commonalities. The three countries have an intertwined history dating back to the Spanish colonization, where they were united under the Spanish government and Catholic Church. Even after Cuba and Guatemala achieved independence, the three countries still maintained several similarities; including similar economies and comparable levels of public health (see annexes). It wasn't until the early 1960's, shortly after the Cuban revolution and the Spanish entrance into the world market, that the three countries began to differentiate substantially from one another in terms of health. During this period of economic growth and reform for Cuba and for Spain, each country came to construct very different healthcare policy and structure. Today, these differences can be used to observe what policies have been historically successful and unsuccessful in promoting health. Drawing upon their common history, each country can look to the moments of historical and medical divergence from one another as a way to better understand the unique features of its own system. In this same vein, each country can also turn to the others as examples of what healthcare policies have led to health successes and failures.

In addition, each country represents a different stage of the demographic transition: Guatemala is an actively developing country, Spain has been recognized as a developed country for the last fifty years, and Cuba maintains an intermediate level of development. However, they are all united in the need to expand cataract surgery in the wake of the senior “demographic tsunami” (Clark, Burkhauser, Moon, et al, 2004). In this way, a case study of each of these countries allows for an examination of how cataract surgery differently affects countries at each stage of the demographic transition. Therefore in addition to observing how contrasting political and cultural practices may shape cataract surgery, a comparison of Spain, Cuba, and Guatemala also allows for a snapshot in time of how this intervention affects countries at different stages of development.

In essence, a comparative analysis of cataract surgery is stronger than an isolated analysis because it allows us to observe how contrasting policies and dynamics mold cataract surgery patterns. Accordingly, for this study three countries which share similar histories in several ways, including cultural, medical, and economic capacities, are examined. The similarities and

the differences in healthcare practices, in particular, cataract-surgical practices, can be used to identify what overarching concepts are most important in order to plan appropriately for a common future with a large senior demographic and a high need for cataract surgery.

Summary

In summary cataracts are an important topic for investigation for multiple reasons. First, they are highly relevant as a disease integral to seniority in an age when the senior demographic is growing at unprecedented rates globally. Second, the disease burden of cataracts has developmental consequences at the global level. Next, the medical community has expressed a greater need for research of cataracts, in particular, interdisciplinary research. In response to the prevalence, burden, and need for interdisciplinary research of cataracts, this study explores cataracts by drawing upon multiple fields. In this vein of interdisciplinary, a country comparison is employed in order to garner a more global contextualization of cataract surgery. Comparing countries is used as a way to identify what cataract surgery looks like at different stages of development and what collective guiding concepts have been successful or unsuccessful for cataract surgery.

For this study, cataracts were chosen because they are an important and contemporary health topic, but it is worth noting that the practice of putting different disciplines into dialogue in order to understand a given disease, and by extension, aspects of the setting in which it exists, is not limited to cataracts. Equally as important as the content of this study, is the practice of constructing interdisciplinary conversation, in particular for health issues. Non-compliance and failed health infrastructure projects around the world show that health cannot be considered without an acknowledgment of the underlying humanity. In this sense, the complexity of cataracts, and of health itself, demand a rhetoric which places equal significance in traditional scientific data, personal meaning, and cultural realities.

Guatemala and cataract surgery



Patients after receiving free cataract surgery from an NGO in Guatemala. Source: Seva Canada, 2011

I. Overview

Cataract surgery rates in Guatemala are the lowest in Central America (875 per million) (Beltranena, Casasola, Silva, et al. 2007). These low surgery rates can be attributed both to the widespread lack of access to healthcare common to developing countries as well as the unique Guatemalan challenge of reconciling traditional Mayan ethnomedicine with western biomedicine.⁶ In this section cataract-caused blindness is first contextualized as a disease within the Guatemalan healthcare framework by briefly examining the history of both biomedicine and ethnomedicine in Guatemala in the last 70 years. Specific aspects of cataract surgery are then considered in Guatemala: who receives it, under what conditions, what barriers exist between citizens and surgery, and what these features elucidate about Guatemala. Finally, we consider

6

We define ethnomedicine as medicine based on Mayan practices of healing and prophylaxis, while we define biomedicine as medicine based on the tenants of the field of biology. Mayan medicine refers to the collective medical practices of the many, diverse constituent ethnicities of Mayan culture.

why low surgery rates are problematic for Guatemalan development and why cataract surgery should be a public health priority.

II. Guatemalan healthcare history

Modern Guatemalan healthcare began with the creation of social security under President Arévalo in 1944. Arévalo maintained a platform of socialist reform and land re-distribution, which was continued by his successor- Colonel Jacobo Arbenz, who was overthrown by a U.S. funded coup in 1954. Leftist militants tried but failed to overthrow the new right wing government in 1960, at which point they began to garner funding from Cuba. The failed coup is now considered the catalytic event that engendered a cohort of leftist guerilla groups and, in an effort to maintain power, an aggressive paramilitary government. The opposition of these two forces began the 36-year civil war and a series of dictatorships which left the country in a prolonged state of division, violence, and at times, genocide. Much of the war was fought in rural territory through the manipulation and utilization of indigenous communities. All public service systems were crippled and public health suffered greatly (BBC 2011).

In 1976, Guatemala suffered an earthquake which left 22,000 Guatemalans dead and 74,000 seriously injured. The natural disaster ushered in numerous NGOs, many of which stayed long after the earthquake to become a permanent component of the Guatemalan healthcare fabric. The aftermath of the quake was a moment that particularly embodied the clash between Mayan medicine and biomedicine, as many indigenous individuals and families refused aid from governmental and nongovernmental organizations, preferring exclusively ethnomedical treatment (PAHO 1998).

The reign of President Ríos Montt (1982-1983) was another large setback in Guatemalan healthcare history. During his short term, Montt was responsible for the deaths of 200,000 indigenous Guatemalans and banned the practice of Mayan medicine. However, Ríos Montt was soon deposed by his own minister of defense, General Oscar Humberto Mejía Victores. Mejía Victores was able to successfully organize elections and the return of democracy to Guatemala as president from 1983-1986 (BBC 2011).

After the new constitution passed, Guatemala constructed a series of human rights and healthcare reforms designed to address the serious health inequalities of the previous regimes. One of the most important aspects of this restructuring was the nationally funded training of

midwives in an effort to reduce infant mortality. Midwifery⁷ is a branch of medicine particularly linked to Mayan ethnomedicine, and as a result, the government's decision to enable and endorse indigenous midwives, represented an important ideological shift, specifically, a recognition of the value of indigenous medicine and indigenous health leaders. During this same time the government also began training *promotores de salud* or "health advocates", individual practitioners instructed in basic healthcare and assigned to more rural, indigenous communities. Many *promotores de salud* have indigenous heritage, and practice both ethnomedicine and biomedicine in their respective communities. Although the *promotores de salud* were (and still remain today) largely underfunded, the creation of this healthcare position helped bridge an important barrier between the two different medical models and addressed national healthcare inequalities. Consequently, public health improved dramatically during the mid to late 1980's, which is particularly evident in infant mortality rates (see data annexes) (Adams and Hawkins 2007).

In the early 1990's, Guatemala received large loans from the Interamerican Bank which allowed for greater development of the public sector. When the civil war finally ended with the 1996 signing of the peace accords, international organizations, NGOs, and the Guatemalan government convened to identify top health priorities for the country. Specifically, the five year plan from 1996-2000 called for: reorganization, integration, and modernization of the health sector; increased coverage and improved quality of basic health services, promotion of health and a healthy environment, increased coverage and improved quality of drinking water and extended coverage of basic environmental sanitation in rural areas, and social participation and oversight as part of public management of the services. These reforms have resulted in marked improvement in virtually all aspects of Guatemalan healthcare (see annexes) (Adams and Hawkins 2007). However, later loans from the Interamerican Bank have encouraged healthcare privatization, and consequently have been widely criticized as undermining the state's ability to provide healthcare, in particular to marginalized populations (Icu Peren, 2007).

⁷ Midwifery encompasses care of women during pregnancy, labour, and the postpartum period, as well as care of the newborn. (WHO, 2012).

III. Modern healthcare structure

Providers

Today, the Guatemalan healthcare system consists of five central providers: the Ministry of Public Health and Social care, the Guatemalan Institute for Social Security, Military Healthcare, the private sector, and Mayan ethnomedicine (**Table 2**).

Table 2. Guatemalan Healthcare institutions and percent coverage for 2007. Source: Adams and Hawkins 2007

Institution	Coverage (%)
Ministry of Public Health and Social Care	32
Social Security	16
Military Healthcare	0.21
Private Sector	10
Mayan ethnomedicine	Unknown

Collectively, all of the formalized state and private providers cover only 58.21% of the population. The remainder of the population has no access to formalized private or public healthcare. Given the several different actors listed above, coverage in Guatemala is largely patchwork in nature and approximately 40% of the population has no formalized coverage.

State Institutions

The biomedical healthcare infrastructure itself is a four-tiered hierarchy. At the highest level are specialized hospitals, followed by departmental/general hospitals, health centers (including health posts or clinics), and finally health advocates. Each level is correlated with the two Guatemalan medical models. The specialized hospitals and departmental hospitals, practice exclusively biomedicine while health centers and *promotores de salud* practice a mixture of each system (Adams and Hawkins, 2007). Because clinics are often located among and staffed by indigenous populations, the Mayan ethnomedical model seems to be much more widely accepted than at the higher tiers. Recently, indigenous Guatemalans, have been found to use an increased combination of traditional ethnomedical remedies and biomedical treatment, using healthcare posts in particular (Glei 1999). Additionally, medical anthropologists have found *promotores* to

practice ethnomedicine and biomedicine according to the needs of the patients. *Promotores* familiar with both models, have been observed to provide treatment within the model they believe most responds to the needs of the patient, alternating between Mayan plant remedies and traditionally biomedical drug therapies (Adams and Hawkins 2007).

Although, rural Guatemalan communities bear most of the disease burden of the country, between the ethnomedical and biomedical facilities, typical rural Guatemalan communities are not isolated from healthcare (Icu Peren, 2007). Most have six or seven sources of care, including a well-supplied pharmacy and frequently a volunteer anti-malaria staff which provides testing and treatment (Weller, Trenton, Robert, 2007). Therefore, in our portrait of the Guatemalan healthcare landscape, it is important to bear in mind that although there exist serious health disparities, most of the country sustains a degree of interaction with different medical systems.

Non-governmental Institutions

1. NGOs

Non-governmental organizations play a significant role in healthcare administration; they are major providers for citizens without formalized medical care and play an integral part of the healthcare landscape. Their presence is not only heavily depended on, but it also influences government health policy. A 2009 WHO statement, regarding NGOs reported, “Más que actores emergentes que simplemente se suman al sistema preexistente, los grupos de base y las organizaciones no gubernamentales, están reconfigurando tanto el modelo de atención como los circuitos de financiamiento para la salud.”⁸ In this sense, NGOs are actively molding the Guatemalan healthcare model, in particular, with respect to financing. The large presence of NGOs differentiates Guatemala from Spain or Cuba, making healthcare institutions and providers much more diverse and numerous.

2. Ethnomedicine

Mayan ethnomedicine is the other large non-governmental institution which provides healthcare services. In general, “Mayan native medicine, (...) is supported by the three pillars of the Mayan people's understanding of the universe: a holistic approach, balance, and spirituality.”

⁸ Our translation: “More than emerging actors which are simply added to the pre-existing system, grass-roots groups and non-governmental organizations are reconfiguring the model of service just as much as they are reconfiguring the circuits which finance health.”

(Icu Peren, 2007). The medical system is composed of traditional healers such as midwives, *chayeros* (spiritual guides who provide treatment for blood related diseases), and physicians. Mayan medicine has been increasingly integrated into the state healthcare framework recently. Nationally, health centers and health posts are being trained in Mayan medicine, and Mayan medicine has been incorporated into the curriculum for a variety of health training schools, including nursing. In fact, at the University San Carlos de Guatemala, the masters in public health program offers a degree in Mayan medicine. This fusion or duality in medical models is due in part to the adaptability of Mayan medicine. As one (biomedical) doctor stated, “Mayan medicine operates in parallel with the Western health system, changing and adapting but always maintaining its links with spirituality” (Icu Peren, 2007).

Many critics of biomedicine and proponents of a dual medical model, cite biomedicine as non-curative and Mayan medicine as a much more efficacious health practice. This concept may seem abstract, perhaps even unfounded, to biomedical subscribers. However, there also exists a biomedical explanation for the efficacy of Mayan medicine insofar as Mayan medicine takes into account the spiritual, social and psychological needs of the patient. Sir Dr. Michael Marmot, director of the Institute for Society and Health at University College, England, has championed the link between individual perception of place in the world and health. In his Harveian Oration⁹ he states, “Failing to meet the fundamental human needs of autonomy¹⁰, empowerment, and human freedom is a potent cause of ill health” (Marmot 2006). He gives a more biological explanation for this phenomenon in his studies of neurological pathways:

A (...) type of pathway linking autonomy and engagement, or human flourishing, to health is through chronic stress pathways. Both the hypothalamic pituitary adrenal axis and sympatho-adreno-medullay axes are important. (...) Low-status animals have higher cortisol animals than high status animals. Frequently, low status is associated with being on the receiving end of stressful encounters [and a] stronger link between low status and cortisol (Marmot 2006)

Level of stress is a well-known determinant of health, and therefore the relationship between status and stress is a powerful biological example of the correlation between perceived location in society and level of health. For that reason, biomedically, a system which addresses the patients’ sensibility of place with in a cultural, spiritual, and family network seems more

⁹ The Harveian Oration is an annual lecture held at the Royal College of Physicians.

¹⁰ In this context, autonomy refers to perception of status.

likely to provide effective treatment. Because biomedical encounters are not always respectful of indigenous culture, they often treat the patient as a “lower status” individual. This kind of discrimination is biologically ineffective for the recovery and treatment of the individual.

As we begin to shift our gaze towards cataracts and consider the relative accessibility of biomedical institutions, this relationship is important. Many individuals who require cataract surgery in Guatemala have to assess the kinds of stress they may encounter in interacting with biomedical practitioners and systems.

IV. Cataracts in the Guatemalan healthcare framework

Cataract Surgery in Specialized Surgical Centers

Cataracts are situated into the Guatemalan healthcare fabric as an emblematic pathology of the system itself. Cataract surgery can be traced back to many early civilizations and their different medical philosophies, including ancient Egypt, India, Babylon, and Greece, but today it lies almost exclusively within the realm of biomedicine. As a biomedical procedure, it is relegated to the top tiers of Guatemalan healthcare. In fact, although Guatemala has the lowest rate of cataract surgery and number of ophthalmologists in Central America, Guatemala City hosts the largest Central American ophthalmologic center: *Visión Integral*. This robust specialized hospital can serve as an example of the healthcare disparities in Guatemala and stratification of the two different national medical models.

Visión Integral is the regional center of reference for pediatric ophthalmology, the supplier of ophthalmologic equipment for El Salvador, and Mexico, and a primary medical tourist site for Central America, Spain, and the United States. It is also the only hospital for which state subsidized health insurance is available for cataract surgery. With a skilled team of surgeons, advanced ophthalmologic technology, and diverse sources of funding, the hospital has a high success rate for cataract surgery and glowing patient testimonials. *Visión Integral* and other similar specialized hospitals (of which there are one or two throughout the country), are the primary providers of cataract surgery for Guatemalans who are non-dependent on NGO funding (Visión Integral 2011; Limburg, Silva, and Foster, 2009).

Rural cataract surgery: Analysis of barriers to access

In sharp juxtaposition to this regionally operating hospital, Guatemala has the highest rate of bilateral preventable blindness in the region, and most of the contributing pathologies can be localized to rural and indigenous communities (Limburg, Silva, Foster, 2009; Icu Peren, 2007)(see annexes for percent of population in rural areas from 1960-2006). Across the world, rural populations have a higher rate of cataract-caused blindness, and this is also the case for Guatemala. One recent survey found that 94% of blindness in rural Guatemala was preventable, with cataracts as the leading cause (Limburg, Silva, Foster, 2009). The cataract surgeries that do take place happen in NGO/private funded hospitals, or improvised eye camps. This same report from rural Guatemala found 15% of cataract surgeries to take place in a public hospital, 32% in an NGO hospital, 29% in a private hospital and 24% in eye camps -a number three times greater than the eight other Latin American countries surveyed (Limburg, Silva, and Foster, 2009). Although data for cataract surgery in rural Guatemala is limited, recent WHO surveys have found that on average 1/3 of rural Guatemalans with bilateral blindness¹¹ due to cataracts will undergo surgery (Beltranena, Casasola, Silva, et al. 2007) In this section we examine why such a small proportion of rural Guatemalans receive operations and evaluate the multiple barriers to surgery these patients confront.

Location

A typical cataract surgery provider for a rural Guatemalan is usually an NGO or a non-Guatemalan government provider. Some examples of providers are: the 2009 Cuban donated ophthalmologic hospital to the municipality *Villa Nueva*, which provides cataract surgery at little or no cost to the patient, the U.S. “floating Navy hospital” during its Latin American tour in 2011, and various Christian and humanitarian organizations eye camps (BBC, 2011; Hernández 2011).

Eye camps for cataracts date back to the 1870’s and 1880’s in rural India, where they were provided by the Indian Medical Service (Cohen, 2011). Since their origin, cataract surgery camps have been highly controversial, largely because the patients are used in order to provide ophthalmologists with human subjects for new techniques or gain more practice. Although this type of exploitation has not been specifically documented in Guatemala, it has been a trend in

¹¹ Blindness in both eyes.

many developing settings. Moreover, the very concept of the camp of itself may be problematic.

Recent research on cataract camps by Lawrence Cohen states “cataract camps presume a mass population that chronically lacks both access to and information about appropriate health resources and that depends upon the gift of these resources through a form—the camp—able to treat the mass in its entirety” (Cohen, 2011). In this way, the structure of a camp, regards the patients as a collective unit, a mass united by their pathology. Free interventions may be beneficial to the patient, but the treatment of the patient as part of a dependent mass may ultimately be an oppressive medical relationship. The inherent oppression in this kind of structure is part of why uptake in cataract surgery has been a consistent problem in developing countries (Cohen, 2011, Unite for Sight, 2020). Although they may be well intentioned, eye camps place the patient as part of a disabled mass with a foreign surgeon as their provider, relegating patients to lower socio-medical strata. The repression of the power structure can be amplified when there is an explicit religious agenda or patronizing providers and volunteers. In Guatemala, more research is needed to evaluate if the power structure of the camp and other associated factors are, in fact, deterring patients from receiving cataract surgery. However, camp structure has dissuaded people from perusing cataract surgery, in other developing settings and although there is no documented resentment of the camp as a major barrier between individuals and cataract surgery in Guatemala, it is likely one of the factors accounting for the underutilization of cataract-surgical services.

Transportation

Like many biomedical treatments, ophthalmologic facilities are concentrated in the urban and private sector, which is why transportation and cost of transportation are important barriers between rural individuals and cataract surgery. However, few rural communities are located more than approximately 10km away from biomedical facilities and many of the studies done on cataract surgery in Guatemala do not identify transportation as the principal deterrent in receiving surgery (Beltranena, Casasola, Silva, et al. 2007; Limburg, Silva, and Foster, 2009; Langsingh, Resnikoff, Tingley-Kelley, et al., 2010; Couch 1991; Weller, Trenton, Robert, 2007). Although there are only a few specialized clinics such as *Vision Integral*, cataract surgery itself is widely available throughout the country (Hernández, 2011). In fact, in some rural settings biomedical treatments may be more readily available than plant based treatment or indigenous

healers (Adams and Hawkins 2007; Couch 1991). A study done in 1999 evaluating indigenous women's use of biomedical facilities found "no evidence to support the hypothesis that lack of access to services explains lower use of biomedical providers by indigenous women" (Glei 1999). This same study found that sociocultural factors associated with ethnicity were the significant deciding factor explaining modes of biomedical health services during pregnancy, rather than ability to access a biomedical facility. Because biomedical facilities are not as easily accessible for rural populations as they are for urban populations, transportation should still be considered as a reasonable barrier to cataract surgery. However, based on other trends regarding biomedicine, and the result of studies researching cataract surgery and biomedicine availability in Guatemala, transportation should not be considered the primary factor restricting access to cataract surgery.

In addition, transportation difficulties can often form a distorted view of rural populations. For rural communities, it is common for outsiders to perceive a center-periphery dynamic, where the rural territory exists as a hinterland. Such a mentality may lead organizations who provide medical interventions to perceive their efforts as "innovative" (Pinto, 2011). But more often than not, rural populations have a long history of interacting with the modernity (in this case the biomedicality) traditionally associated with the "center". In rural Guatemala for example, there exists a history of state, non-governmental, and biomedical interventions. From experimentation performed by the U.S. in 1944, to U.S. Mayan research in the 1950's, to midwife training programs in the 1980's, rural Guatemala can hardly be considered as a space unfamiliar with biomedicine (Edgar, 1954; BBC, 2011). More broadly speaking, rural Guatemala has a long history interacting with the urban "center", especially as a space that was exploited for political agendas during the civil war. Because of this long, often abusive, relationship that rural Guatemala has sustained with both the urban parts of the country and with biomedicine in particular, it is important not to perceive the zone as a rural space untouched by 'modernity'. Thus, while the transportation cost of an intervention, such as cataract surgery, represents an important barrier, at the same time, rural Guatemala has a long history of interacting with biomedicine such that it is not a space removed from the reach of its technologies.

Cost

The average cost of cataract surgery in rural Guatemala requires further investigation, especially for organizations looking to make this procedure more available throughout the country. Of the rural Guatemalans who receive surgery, recent findings show that approximately 35% did not pay at all, 57% paid partially, and 8% paid fully. Such variety corresponds to the diversity in cataract-surgery providers-while some NGOs or private providers offer the service for free, others charge up to 1,000 USD (an amount commonly found in the private sector internationally). One recent survey found the average cost for cataract surgery for a rural Guatemalan was 65 USD. Compared to the estimated average monthly wage of a farm worker (75-100 USD) and the average pension of a rural Guatemalan (25 USD), the cost of cataract surgery represents a significant portion of personal income and makes cataract-surgery a large financial burden (Limburg, Silva, Foster, 2009; Beltranena, Casasola, Silva, et al. 2007).

However, similar to transportation, cost has not been found to be the determining factor in accessibility, which is consistent with Guatemalan trends in usage of biomedical services. Regarding care during pregnancy, although biomedical services are substantially more expensive than ethnomedical resources, the financial resources of the household have not been found to be a determining factor in access to biomedical care (Glei, 1999). Indeed, although the average cost of cataract surgery is a significant portion of personal income, the cost is not nearly as burdensome as in many other developing countries, and it seems to fit somewhat more reasonably within the affordable healthcare expenditure range (Naidoo, 2007). Recent surveys of cataract surgery in Guatemala have found that only 12% of bilaterally blind individuals identified cost as their primary barrier in receiving cataract surgery (Limburg, Silva, and Foster, 2009). Additionally, in eye camps run by *Vision Integral* in the north of the country along the Mexico border, most patients are able to pay in part for their cataract surgery. Although their payments may be delayed, in general, patients are able to contribute financially towards their operations (Hernández 2011). Therefore, cost is not the only determining factor in access to cataract surgery, a trend corroborated by other studies which have observed usage of biomedical facilities. In general, in Guatemala usage of healthcare post services (local biomedical services) is not associated with financial resources and biomedical free care is highly underutilized by indigenous populations (Pebley 1996). Similar studies in South Asia have also found that free cataract surgery (including transportation) does not always ensure patients participation

(Snelligan, Shrestha, and Gharti 1998).

Other studies in Africa and in Asia have found that on average people are willing to pay for more than the surgery costs when they learn the procedure is available (Shrestha, Thakur, Gurung, et al., 2004; Lewallen, Geneau, Mahande, et al., 2006). In general, even in settings which provide universal coverage, such as Spain, free cost for interventions does not always guarantee utilization of services (Ramon de Paramo, 2008). Therefore, we can perceive the presence of other important dynamics which describe low rates of cataract surgery besides a simplistic economic explanation.

The fact that cost is not the only determining factor for surgery, contrasts strongly to common perceptions of surgery in the developing world. In his defense of promulgating surgical aid, Paul Farmer states, “Although disease treatable by surgery remains a ranking killer of the world’s poor, major financiers of public health have shown that they do not regard surgical disease as a priority” (Farmer 2008). As a highly involved procedure, surgery is often not considered in our efforts to provide aid for the poor because it is “too costly” and “too complex.” Yet if we look at the trends in Guatemala, the reality of lack of access to surgery is neither simple nor straightforward. The major barrier in cataract surgery is not simply that it is too expensive (or too far away). The results of ethnographies regarding biomedicine in Guatemala and of research regarding cataract surgery reveal more complex dynamics at work (Adams and Hawkins, 2007). While cataract surgery is by no means a necessarily affordable cost for rural Guatemalans, cataract surgery (indeed all surgical procedures) should not be simply dismissed as inaccessible because of financial resources. Moreover, as Farmer enumerates the barriers to surgery, he states “There are exceptions—innovation in cataract removal is often cited” (Farmer, 2008). Therefore, among surgeries, cataract surgery can be distinguished as one of the more simple more attainable procedures, which is another reason why it should not be written off as simply “too costly”. There are multiple other barriers in play that extend beyond out of pocket expenses. It may be convenient to simply dismiss surgery as something ‘too expensive’ for a rural setting, but that assumption may not be an accurate or holistic description of the healthcare dynamics, as is the case for Guatemala.

Lack of information

A 2006 study found that 68% of rural Guatemalans cited “unaware that treatment was

possible” as their reason for not pursuing cataract surgery. While the cost of operation and transportation are important variables driving low cataract surgery rates in Guatemala, lack of information appears to be a major contributing barrier (Limburg, Silva, Foster, 2009). This lack of information corresponds with the recent findings which describe the ophthalmologic systems in place as “underused” and recommend increased awareness of the procedure rather than broad expansion of services (Limburg, Silva, Foster, 2009; Langsingh, Resnikoff, Tingley-Kelley, et al., 2010). The fact that these studies highlight the underuse of cataract surgery centers, rather than the absence of surgical providers, speaks again to the problematic common perception of surgery: that it is too costly and complicated to be considered for developing environments. It also speaks to the lack of dialogue between rural populations and cataract surgery providers. Although there has been measured increase in joint use of biomedicine and ethnomedicine, the unawareness surrounding cataract surgery points to the distance that continues between indigenous populations and biomedical interventions.

Biomedical inaccessibility

One important barrier that has been continuously under-examined in research regarding cataract surgery in Guatemala is the inaccessibility of biomedical facilities on cultural grounds. Recent surveys have successfully identified that cost or transportation are not the most important barriers regarding access to surgery, and that lack of information seems to be highly correlated with low surgery rates. But these studies have not investigated, and in fact fail to even mention, the presence of a competing medical model and the ethnic motivations behind resistance to biomedical facilities. Looking at both the quantitative output of such studies regarding cataracts in Guatemala, and recent ethnographies regarding other biomedical procedures, we can perceive a clear ethnic stratification in usage of biomedical services. A study in the mid- 1990s found that even when demographic, socioeconomic, and community characteristics were controlled, there still remained an ethnic differential in use of biomedical care (Pebley 1996). Indeed, in developing countries around the world, free surgery and transportation have still not guaranteed local participation in cataract surgery (Snelligan, Shrestha, and Gharti 1998). Accordingly, cataract surgery access needs to be evaluated with a focus towards the politics of biomedicine due to the fact that, “regardless of their general or specific intent, development and institutional programs are always negotiated in terms of local political relations” (Pinto 2000).

As previously stated, Guatemala has enough ophthalmologists and facilities to meet the cataract surgical needs of the country, “The number of available eye surgeons suggests there is sufficient capacity to increase the number of cataract operations per year and thus reduce the prevalence of blindness and low vision caused by cataract” (Limburg, Silva, and Foster, 2009). This fact, corroborated by the trends observed in traditional scientific papers and other anthropological ethnographies, all point to an overarching difficulty in accessing biomedicine because of a resistance to biomedicine as an institution. The reasons behind such a resistance are simultaneously historical, contemporary, collective, individual, and to a degree, unknowable to outside discourses such as these. They may be related to the aforementioned perception of biomedicine as ineffective and unable to address the multiple needs of the patient. They may be related to a history of Mayan oppression through biomedicine. Regardless of the reasons it is important to recognize in any evaluation of cataracts, that there exists ethnic stratification in usage biomedical resources on purely cultural grounds. The culture of biomedicine is an important barrier to recognize and a driving factor behind surgery rates.

Poor outcome

The second most cited reasons for not pursuing surgery, fear of the surgery and the outcome, is much higher in Guatemala than in other Latin American countries according recent research (Beltranena, Casasola, Silva, et al. 2007). A contributing influence to this phenomenon could lie in Guatemala’s exceedingly high rate for “poor” surgical outcomes (approximately 43%) (Limburg, Silva, Foster, 2009). These poor outcomes have three root causes: insufficiently experienced ophthalmologic staff, inadequate surgical facilities, and exceptionally developed cataracts. The dearth in funding for cataract surgery often means that for individuals with little biomedical agency, they must use the provider that is most accessible. Thus, in rural areas, ophthalmologic surgeons may be inexperienced or the facilities compromised (such as in temporary eye camps) (Cohen, 2003).

However, another equally contributing factor to poor outcome is the state of the lens and the development of the cataract. Patients who can afford the surgery and have regular access to an ophthalmologist, tend to receive the surgery earlier in the development of the cataract. Additionally, individuals who are regularly reading or interacting with a screen, tend to notice cataracts earlier because of their increased awareness of their visual acuity, further incentivizing

surgery. However, individuals who are not aware of the procedure or who have limited access to biomedical interventions, tend to wait for an extended period of time before pursuing cataract surgery (if they pursue it at all). By the time of the operation the cataract is much more developed, often resulting in a much more challenging procedure and often the need for an entirely different (and less effective) surgery- extracapsular cataract extraction (ECCE) (BBC 2011)¹². Moreover, in rural settings this procedure is used more frequently because it is a convenient way to cut costs (Hernández 2010).

Thus, the cycle seems iterative. People without access to ophthalmologic services wait until the cataracts are advanced and intolerable to the patient, resulting in a difficult operation and increased likelihood of a poor outcome or ECCE, which in turn discourages that patient's network from pursuing cataract surgery. Perhaps it is cycles such as these that contribute to the distance between biomedicine and the majority of the country, reinforcing the noted "underutilization of services".

Ethnomedical treatment

Regarding ethnomedicine, the earliest non-surgical alternative for cataracts actually dates back to Mayan plant based therapies, specifically a genus known as *Sedum* (Palarea, 1954). *Sedum* is a plant genus (also known as stonecrop), which is crushed and condensed to provide topical treatment for opacified corneas and lenses. In the 1950's the biomedical community briefly explored *Sedum* as a non-surgical treatment for cataracts, basing its research out of Guatemala, and recent research has identified high concentrations of antioxidants in *Sedum* (the lack of which is associated with cataract development). Nevertheless, biomedically, *Sedum* based therapies are not widely practiced, researched, or understood. As such an under-researched component of ethnomedicine, it is outside the scope of this paper to evaluate the efficacy of this plant based therapy within the biomedical and ethnomedical models. However, it should also be noted, that as such a thoroughly ethnomedical intervention, the plant based topical treatment of cataracts is one of these more accessible options for rural Guatemalans (Palarea, 1954; Mavi, Terzi, Yldirim, et al., 2008).

¹² In intracapsular cataract extraction, the entire lens and capsule are removed, making the insertion of an intraocular lens impossible. For the patient, this means that they must use very powerful glasses in order to refract and focus light (Aguilar, 2011).

In summary, as a systematically biomedical intervention, cataract surgery rests in the top tiers of the Guatemalan healthcare hierarchy. Like many biomedical interventions it remains largely inaccessible to poor and marginalized populations because of key institutional barriers, including: transportation, cost, lack of information, biomedical inaccessibility, and poor surgical outcome. In essence, the structure and the operation of the medical system itself makes cataract surgery unavailable to most citizens. Mayan ethnomedicine can provide an alternative treatment, but its efficacy compared to surgery is not well studied and the rural poor, although they may have access to plant based therapies, still maintain the highest rates of cataract-caused vision loss. Thus, cataracts themselves are stratified across class differences. They are concentrated into marginalized populations, where they develop and ultimately lead to blindness.

V. Challenges of low cataract surgery rates in Guatemala

The inequality in access to cataract surgery is evident in the disparities of accessibility to the procedure, in terms of location, cost, transportation, awareness, biomedicality, and outcome. However, in order to understand why this inaccessibility is problematic, we should consider the consequences and effects of low rates of cataract surgery for Guatemala.

Cataracts as a national economic burden

One of the many reasons that low cataract surgery rates are an important issue for Guatemala and Guatemalan healthcare is the link between cataract surgery rate and gross national income. Globally, low surgery rates have been correlated with low gross national incomes (**Fig.3**).

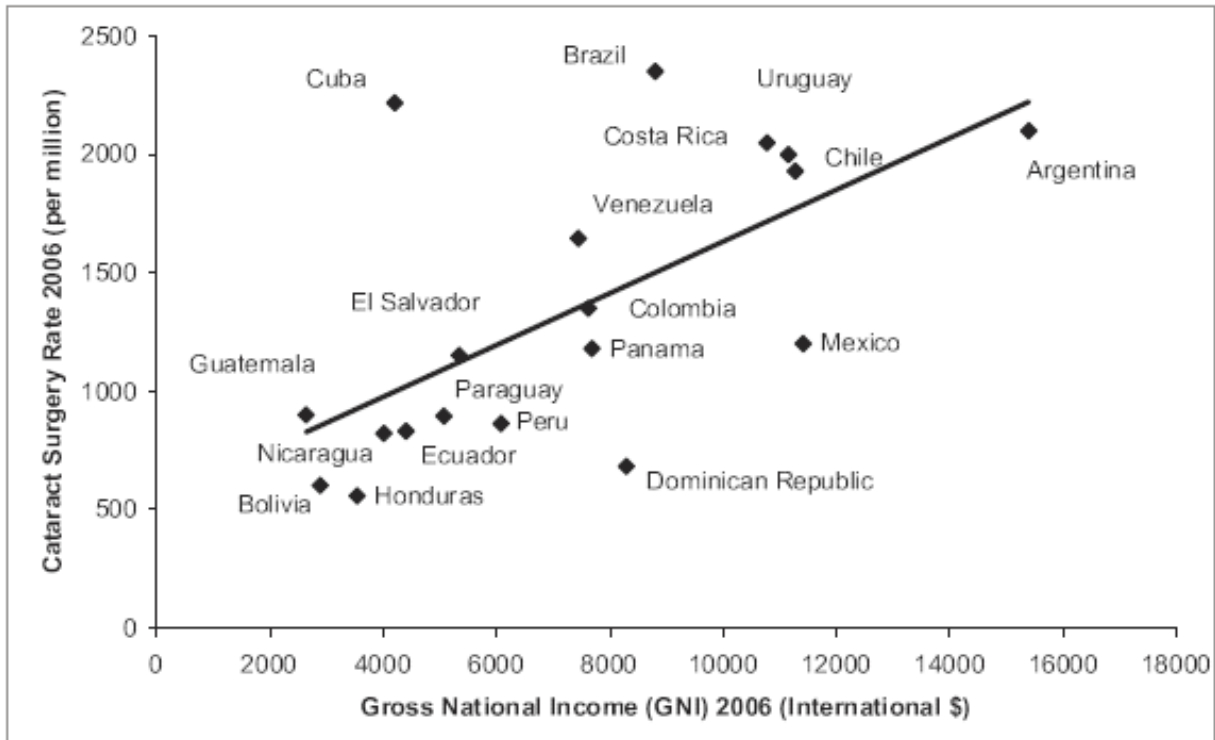


Figure 3. Gross National Income vs. Cataract surgery rate 2006. Source: Limburg, Silva, Foster, 2009.

There are multiple factors at work accounting for this relationship. Although there is a generally linear correlation between gross national income and cataract surgery rates, this is not to say that a low gross national income necessitates low cataract surgery rates. As shown by many outlier countries, such as Cuba or Brazil, poor countries can have relatively high cataract surgery rates. Similarly, low cataract surgery rates do not necessarily generate a low gross national income.

However, there is still a link between cataract surgery rates and national economy in Guatemala, which makes cataract surgery an important contemporary health topic. The conditions of loans from the Interamerican bank in the late 1990's stipulated greater privatization of healthcare services, which meant that individuals without privatized insurance found themselves assuming a greater portion of their healthcare costs. This economic policy is problematic because it diverts people's personal income away from other aspects of the economy and from consumerism. Essentially, if people need to spend a substantial part of their money on their healthcare, they are less able to spend it in other sectors which may boost the local and national economy. This is also the case for cataract surgery in Guatemala, where people in rural Guatemala without insurance find themselves spending a significant portion of their personal

income towards the procedure (Limburg, Silva, Foster, 2009). Although low surgery rates do not exclusively account for a low GNI in Guatemala, the flow of personal income into healthcare services and away from other aspects of the Guatemalan economy (such as public service systems, education, and real estate) could be one of the factors that contribute to the observed relationship between cataract surgery rates and national development (Naidoo, 2007).

Accordingly, future policy makers should consider that if citizens are compelled to invest substantial personal capital into healthcare, they are less able to contribute to other aspects of the Guatemalan economy. This relationship is part of why making cataract surgery more accessible and a part of primary care is relevant for Guatemala's economic future.

Cataracts as a contributor to disability

Another way that low rates of cataract surgery impede national development stems from the increasing numbers of disabled individuals. As Martha Peláez noted in her article *Building the Foundation for Health in Old Age in the Americas*, “Age-associated cataracts are the main cause of blindness among older adults, and thus a strong contributor to disability. This is a public health challenge. In the majority of cases, postponing or avoiding blindness is feasible. Even poor countries can and should invest in public health interventions and lower the rate of disability among the old” (Peláez 2005). For Guatemala, this a particular public health challenge because the state has relatively little infrastructure to accommodate disabled persons, disenfranchising disabled individuals and leaving them with few mechanisms through which to contribute economically, and otherwise, to the country. In response to the marginalization of the disabled, one analysis of disability (including cataract-caused blindness) in Guatemala noted that, “Guatemala’s approach to its disabled citizens are mixed. Closely knit family units care for and even overprotect their family members who are disabled. (...) Yet many of those with disability are objects of pity, a source of family shame, and certainly not considered mainstream participants of society” (Couch 1991). Considering the incapacity of disabled citizens to participate in mainstream society, cataract-caused blindness, indeed any blindness, has consequences nationally in the sense that it contributes to the disabled population. The relationship between the family, community, and the disabled person may be different in urban versus rural, or indigenous versus non-indigenous populations, especially in terms of social stigmatization. Regardless, the idea of disabled persons and a non-mainstream part of society

seems to be an overarching feature throughout the country.

Guatemala has recently established programs to address disability related to blindness such as the *Comité pro ciegos y sordos de Guatemala*¹³ and the Ministry for Handicap improvement. The private sector has also risen to meet some of the needs of the disabled, such as the Washington based organization “Partners in the Americas”. However, these combined efforts still do not meet many of these needs of disabled individuals and, as a result, any increase to the disabled population further strains a system already lacking structural integrity (Couch 1991). In this way, if cataract-caused blindness, and indeed all manifestations of all preventable disability, are not treated at an early stage, the ultimate cost of future disability may be higher than the immediate savings (Rodríguez, Gallo de Puelles, Jovell, 1999).

Cataracts as an individual burden

1. Human experience and vision

Finally, perhaps the greatest burden of cataracts lies in the experience of the individual. Collectively, low rates of cataract surgery are problematic for Guatemala because they hinder national economic development and because they create an increasingly large disabled population. But as we consider the wide scale impact of cataracts as a pathology, we should not lose sight of the importance of the individual experience. In addition to the economic and infrastructural arguments for greater access to cataract surgery, the relationship between the individual and their vision is a compelling argument on humanitarian grounds.

The ability to see or not is a driving force shaping human experience: one Guatemalan patient who received cataract surgery in one of the Cuban-funded hospitals reported, “Vision is half one's life” (McKinley, 2007). The ways in which vision molds our lives and our interactions are endless, although many of them have come under academic inspection in recent decades. One contemporary example is the work of feminist scholars who explore the ways in which the male gaze can render the woman an object as a form of visual oppression. A prominent illustration of this movement is the seminal work of Laura Mulvey who explored how women are exhibited as objects rather than subjects in film. Itself a highly interdisciplinary piece, Mulvey's *Visual Pleasure and Narrative Cinema*, drew together psychoanalysis and film studies to show how visual representations form gender identities (Sassatelli, 2007). This artistic theme is only one of

¹³ Our translation: “Committee for the blind and deaf of Guatemala.

the many ways through which we construct power dynamics using sight. Other visual studies include discussions of the post-colonial gaze, the medical gaze, and the western gaze, all of which use vision as a way to negotiate power. And power dynamics themselves are only one of the ways in which vision affects our interactions. The ability to see, or not, has countless implications upon our human experience. As such a determining factor of vision, cataracts are intimately related to our livelihoods. This relationship is what defines the individual burden of cataracts, and what compels cataract surgery to be considered as a humanitarian cause.

2. Patient testimonials

President of the Guatemalan Ophthalmological Society, Jorge Hernandez, recognizes the profound effect cataract surgery can have on individual lives, and regularly conducts interviews with post-surgery patients to find out what their surgery has meant to them. His surveys generally reaffirm that cataract surgery is a highly necessary and important intervention for many. One particularly meaningful interaction was with a doctor who had to close his practice due to his increasingly poor vision. This doctor helps to represent the lack of awareness of cataract surgery in Guatemala, even among the medical community. When the cataracts were mature enough according to both the patient and to Dr. Hernandez, he underwent cataract surgery for his left eye. As the two were leaving the operating room, Dr. Hernandez temporarily removed the patch covering the patient's eye and asked him if he would read the detailed post-operation instructions on a sheet of paper. The patient began to weep. He could read the instructions, and decided to re-open his practice. In a post-surgery follow up, the patient recounted how before the procedure he was depressed, and nearly entirely house bound. After his cataracts had been removed, he felt that he was once again able to regain control of his life. He could once again live on his own terms

Another patient story that stood out to Dr. Hernandez was that of a fifty five year old woman who had high astigmatism and needed glasses her whole life. Before surgery she could not drive, or perform most other basic activities. Her struggle reached a zenith when she accompanied her daughter to buy her wedding dress. Every dress appeared to be a faded and beige color in the patient's eyes, and she became increasingly frustrated and discouraged. In the weeks after her surgery, Dr. Hernandez asked the patient what cataract surgery had meant to her,

and she too began to cry, describing the moment in which she could finally see the brilliant beautiful white fabric of her daughter’s wedding dress. After receiving the surgery, the patient expressed how grateful she was to be able to “do everything in her life” with clear vision, and even more significantly, without glasses. Guatemalan patients in Cuban hospitals have likewise reported sincere appreciation and a newfound independence. One patient professed “I never imagined anyone would help me the way they have helped me, I thought I was going to end up blind” (McKinley 2007).

Although seemingly obvious, it is worth reflecting on the fact that cataracts take away the fundamental ability to see. The gradual loss of one of the senses is not something to be taken lightly. Vision loss is at its core an individual burden. While one must consider the economic and infrastructural implications of cataract surgery rates, the individual element should not, must not, be eliminated. When international organizations, state governments, and healthcare representatives discuss cataracts, they are simultaneously discussing the happiness, autonomy and well-being of each individual. When viewed through a humanitarian lens, cataract surgery is an important intervention because, among other reasons, it lessens the suffering of the individual.

Rate of increase corresponding to growth of senior demographic

Exacerbating the magnitude of all of the burdens enumerated above is the speed with which the elderly population is growing in Guatemala (**Table 2**). As an inevitable pathology of aging, the incidence of cataracts will increase in proportion to the growth of the senior demographic (Arteaga 2011).

Table 2. Estimated percent of population over 50 in Guatemala

Country	2005 (%)	2010 (%)	2015 (%)	2020 (%)	2025 (%)	Increase (%)
Guatemala	11.3	12.1	12.8	13.3	14.5	27.9

Source: Limburg, Silva, Foster, 2009

In fact, the growth of the senior population in Latin America is an unprecedented demographic phenomenon. According to the latest PAHO survey of aging in Latin America, “The populations of the countries of Latin America and the Caribbean are aging at a rate that has

not been seen in the developed world” (Albala, Lebrão, León Diaz, et al. 2005). This is to say Latin America is the fastest aging region in the world. The unique demographic trend can be accounted for by huge improvements in public health indicators, such as infant mortality, life expectancy and infant mortality (see annexes) (WHO Report, 2011). However, as infectious diseases and other public health problems associated with poverty have declined, chronic and non-communicable disease rates have increased (WHO Report, 2011). As one of these chronic non-communicable diseases, cataracts incidence will increase in so far as the senior population also continues to grow.

Another confounding variable in the increased incidence of cataracts in the coming year are the health disparities evident in Guatemala. With lack of access to surgery, cataract incidence can be expected to increase much more rapidly. Additionally, Mayan populations in Guatemala are at particular risk for cataracts due to the presence of pseudoexfoliation- a genetic disorder which predisposes individuals to cataracts. This disorder has been only recently discovered, and has been found to be most prevalent in Scandinavian countries. However it has also been observed to have a high incidence in indigenous populations in rural Guatemala (Hernández 2011).

Consequently, between the high growth rate of the older adult population, the healthcare disparities of the country, and the particular risk indigenous populations face, cataracts incidence can be expected to increase in Guatemala, exacerbating the many cataract-related problems identified above.

IV. Summary

Cataracts as a reflection of Guatemalan society

In this section, different features of cataracts as a pathology in Guatemala were examined. In our consideration, several key features of modern Guatemalan society were extracted. First, by looking at who has access to cataract surgery in the country, a clear social stratification in healthcare access becomes evident. The robust regional ophthalmological center of the private sector stands in stark contrast to the eye camps of rural populations, and speaks to the health disparities present in Guatemalan society. Upon further inspection of the barriers that account for this disparity, we find several key forces at work. In addition to the traditional barriers that poor

individuals face in gaining access to surgery, such as cost and transportation, we can detect other historical and cultural phenomenon in play. Namely, there exists an alternative medical model and a widespread resistance to biomedical procedures and the dogmas they cultivate. In this way, by analyzing cataracts as a pathology, and who has access to cataract surgery, we can distinguish realities about health disparities and the socio-historical forces contributing to these disparities.

Implications of low rates of cataract surgery

Upon observing the healthcare inequalities cataracts reveal, we then considered why these disparities are problematic and what consequences they have upon Guatemala. Among these consequences are the economic hindrances cataracts produce, such as the growth of the disabled population and the divergence of personal incomes away from consumerism and into medical expenses. Therefore, there are compelling economic arguments for expanding cataract surgery in Guatemala. Additionally, the burden of cataracts is also represented by what is at stake for the individual. As shown through patient testimonials, the wellbeing and livelihood of the individual are also implicated in discussions of cataract surgery. Therefore health disparities in cataract surgery and low cataract surgery rates are destructive for Guatemala in two distinguishing capacities: infrastructural and economic hindrances and preventable suffering of the individual.

Solutions

In recognition of the problematic nature of health disparities as they relate to cataracts, we consider possible ways to address the challenge of cataracts in the final section. Although Guatemala has employed several NGO's such as Vision 2020 and *Operacion Milagro* in order to promote cataract surgery, these efforts have not proven entirely effective. Vision 2020 is falling short of the goals it established and the Cuban doctors of *Operacion Milagro* are migrating from the rural, marginalized settings they began in towards private practices in urban centers (Hernández 2011). Guatemala, then, needs to consider internal solutions. In developing these internal solutions, Spain and Cuba serve as valuable examples, and we consider what each state can learn from collective similarities and differences in the final section.

Spanish healthcare and cataract surgery



La Celestina, Pablo Picasso. 1904

I. Overview

In contrast to Guatemala, cataract surgery is the most frequently performed surgical operation in Spain (Quitana, Escobar, Bilbao, et al. 2006). According to ophthalmologist Dr. Arteaga, “Existen en la actualidad 8 millones de jubilados mayores de 65 años, teniendo en cuenta que la catarata acabará afectando a toda la población mayor antes o después, son 18 millones de ojos potencialmente operables en los próximos 10-20 años.”¹⁴In this section, we examine cataracts in the context of the Spanish setting. As in the previous section, we first define cataracts in the lexicon of Spanish healthcare, examining the history of healthcare and the current structure of the healthcare framework. We then again employ cataracts as a vector for social

¹⁴ Our translation: “There are currently 8 million retirees over 65. Taking into account that cataracts will affect sooner or later all of the adult population, there will be 18 million eyes potentially operable in the next 10-20 years.”

commentary, considering what cataracts and cataract surgery elucidate about Spanish society. Finally, we consider the effects surgery rates have upon the community and the individual and why this procedure should continue to receive attention as a highly relevant pathology.

II. Spanish healthcare history: Transformation after Franco

Modern Spanish healthcare began under the policies of the Franco dictatorship. Beginning with worker's insurance and social security programs, the government was able to cover most of the population to a certain degree for the first 25 years of the regime. In 1964, the United States lifted sanctions off of Spain as part of its Cold War attempts at a global presence. Once the sanctions were lifted, Spain enjoyed considerable economic development and was able to expand its healthcare systems, eventually becoming a truly 'developed' nation. However, like many government systems of the regime, Francoist healthcare has been critiqued for the dogmas it practiced, the way it interacted with marginalized individuals, and its dependence on the church in its administration of benefits.

After Franco died (1975), as Spanish politicians reflected on the insufficiency of the Franco regime's public benefits and the oppressive doctrines attached to the church-provided benefits, they identified the right to healthcare as a secular human right, recognizing that "all rights, along with political freedoms, presume large efforts on behalf of the State, through institutional programs or other mechanisms" (Ramón de Paramo, 2008). To this end, Article 43 guaranteed all citizens the right to state subsidized healthcare. In 1986, Spain passed the *Ley General de Salud* (General Health Law) to stipulate how this constitutional right would be upheld, beginning in earnest a new era of *Reforma sanitaria* (Health Reform) (Socolovsky, 2009).

The conversion of the ideal of universal healthcare into reality has been challenging for Spain. But today its healthcare is generally wide-reaching and meets many of the healthcare needs of its citizens, marking the country as a leader in healthcare (Socolovsky 2009). Today the *Servicio Nacional de Salud* and the respective autonomous communities, "tienen por objetivo dar una sanidad universal y gratuita a todos sus ciudadanos independientemente de su situación laboral o económica y esto lo lleva a cabo el Estado Español a través de sus presupuestos

generales”¹⁵ (Arteaga, 2012). In the following sections we explore how the healthcare system operates and the contemporary national state of health.

3. Modern healthcare: structure, function, and challenges

Framework

The Spanish healthcare system is tiered and highly decentralized. Operating at the National Level, the federal organization INSALUD (National Health Institute) regulates most, but not all, regional and local healthcare infrastructures. Below the INSALUD, are ten regional governing bodies which oversee ten regions of Spain. Each region is composed of autonomous communities (the equivalent of a state for the U.S., such as Cataluña or Andalucía). Most healthcare services are provided, administered, and regulated by these autonomous communities. Healthcare standards and technologies vary significantly from one autonomous community to the next (Rodríguez, Gallo de Puelles, and Jovell, 1999).

Decentralization: current difficulties

This decentralization in healthcare was afforded largely by the General Health Law in 1986, which called for more local regulation (General Health Law, 1986). The diminished federal presence in many state programs echoed a desire for local sovereignty in the aftermath of the federalist dictatorship of General Franco. However, today, the local regulation of healthcare is one of the most highly criticized aspects of the system. Because of the variable standards and regulation for healthcare, treatment across different autonomous communities can be challenging and confusing (Soriano, 2010; Rodríguez, Gallo de Puelles and Jovell, 1999). Different autonomous communities have different healthcare technologies available and provide different healthcare services. In response, Spain passed the Law of Cohesion and Quality in 2003. The 2003 law was intended to establish greater coordination of the National Health System across the country. It outlined a set of basic functions which should be the responsibility of each autonomous community’s healthcare service. It also marks regulations for administration of healthcare, in particular with benefits, pharmacy exchange, health professional training, and

¹⁵ Our translation: “Have as their main goal, to offer universal and free healthcare to all of its citizens, regardless of their work or economic status, which is carried out by the Spanish state as part of its general budget.”

health information systems. In order to monitor the stipulations of the law, Spain created several specialized agencies including: Agency of Evaluation of Technologies, Spanish Agency of Medicines and Medical Products, the Human Resources Committee, the Committee to Assess Health Research and others (Law of Cohesion and Quality, 2003).

Through these organizations Spain has made important steps, in order to garner a more cohesive national health system. However, the decentralization of healthcare still remains a concern for several important reasons. One of these is the persisting underdevelopment and inconsistencies found in healthcare information systems. This is to say, record keeping is often neglected and systems for record keeping very widely from community to community (Health Information Institute, 1998).

Another remaining problem with Spanish decentralization of health systems is the health inequalities it inherently produces. Quality of care varies from community to community, and different communities have different healthcare budgets and state incomes (Spanish Ministry of Health and Consumer Affairs, 2005). Consequently, citizens may receive a lesser quality of care, simply because they live in one of the poorer communities. In particular, autonomous communities with large rural populations, have difficulty meeting the healthcare needs of this sector and providing sufficient outreach (Rodríguez, Gallo de Puelles, and Jovell, 1999). For these reasons, increased homogenization of the autonomous communities is one of the most pressing challenges facing the Spanish healthcare system (Arteaga 2012). However, it is worth noting that in recent years Spain has made an effort to provide more equal healthcare, as is evidenced by the increased presence of *consultorios* or local health centers which provide primary care and other services (Rodríguez, Gallo de Puelles, and Jovell, 1999).

Responsibilities of Autonomous Communities

Although the competencies of each autonomous community are highly debated and continue to be the subject of constitutional law dialogue, each community is responsible for the services outlined in the national catalogs, which include: environmental regulation (safe drinking water, sanitation, pollution regulation, etc.), safe management of food, and primary healthcare (Rodríguez, Gallo de Puelles, and Jovell, 1999). Under Article 12 of the Law of Cohesion "primary care," is defined as the basic level of patient care, prevention of illness, maintenance and recuperation of health throughout the patient's life (Law of Cohesion and Quality, 2003).

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Primary healthcare is provided by physicians, nurses, and other healthcare providers based on location. On average, there are 37 doctors per 10,000 inhabitants (Kaiser Family Foundation 2011). During the past thirty years, primary healthcare has greatly expanded the number of vaccines it requires and administers. Autonomous communities are also responsible for health education and awareness efforts. Most recently these have included campaigns for HIV/AIDS awareness, exercise, contraception, and against smoking (Rodríguez, Gallo de Puelles, and Jovell, 1999).

Psychotherapeutic services

More recently, the Spanish healthcare system has come to embody a psychotherapeutic role for most citizens. On average, 75% of interactions in public outpatient settings are non-medical illness related (Rodríguez, Gallo de Puelles, and Jovell, 1999). A recent analysis of Spanish healthcare noted, "It seems that people distressed by personal and/or socioeconomic circumstances are using primary care centers for relief of systems that, while not related to medically defined illnesses, are equally disabling to the optimal functioning of the individual" (Rodríguez, Gallo de Puelles, and Jovell, 1999). In this way, Spanish health care is very different from the Guatemalan system and more similar to Mayan medicine. The development of healthcare settings as places for psychotherapeutic relief and treatment, signals a more holistic understanding of the well-being of the individual.

As a researcher in Madrid, I had the opportunity to see some of the benefits of the psychotherapeutic services at an eye surgery clinic, observing Dr. José María Aguilar. Dr. Aguilar's days were filled with what should more properly be termed social visits than actual medical appointments. His former patients came in under the guise of checkups or revisions, but what resulted looked more like a visit between old friends, "Yes yes, your progress is coming along nicely, your eyes look great," he would reassure them, "Now how is your family? Isn't little Anita about to graduate from school?" Patients divulged to him intimate details of their lives, and the visits often took on a therapeutic nature. These unscheduled checkups were an opportunity for the doctor to form a personal bond with those who relied on him. They provided his patients with the reassuring feeling of having spoken to a doctor and been validated both physically and emotionally. Although perhaps atypical to the doctor-patient relationship in other countries, the social aspect of patient care that I witnessed in Spain was just as vital to the

healing process as anything else.

Keeping in mind that a variety of external factors, which may not be strictly medical in nature, can affect the well-being and consequently the biological health of the individual, this broader definition of healthcare is important. If primary care centers can provide a measure of relief to patients for their concerns, medical and otherwise, it fosters a closer relationship between the individual and their healthcare network (the lack of which has been particularly destructive in Guatemala). As a result, another recent but increasingly important function of the Spanish healthcare system, is its role as a psychotherapeutic provider.

In summary, the modern healthcare system began in earnest following the death of Franco, with new constitution, and the General Health Law. Throughout much of this country the decentralization of the healthcare system has proven problematic in several capacities. However, in recent years, efforts have been made to address these challenges, such as the Law of Cohesion in 2003 and the increased dispersion of *consultorios*. The main responsibilities of the Spanish healthcare system are to provide environmental safety (including food safety), primary healthcare, health awareness, and mental health.

Financing

Spanish healthcare is funded by a two-tiered pricing scheme where those who can afford private services enjoy superior quality of care, and those who cannot are covered by public benefits. On average, Spain spends \$3,150 per capita on healthcare (WHO, 2011). Nationally, Spain spends approximately 9.7% of its GDP on healthcare (WHO, 2011). However, these values include pharmacological expenditures, meaning the amount spent on providing healthcare is actually less than both these values (and many EU and OECD countries) (OECD 2011). Capital gained from pharmacies is distributed from the federal government towards the local autonomous communities to subsidize their healthcare systems (OECD 2011).

There are no user fees for services subsidized by the state (Ministry of Health and Consumer Affairs, 2005). Since the beginning of this country study, in 1985, Spain has generally expanded its state subsidized interventions (Rodríguez, Gallo de Puelles, and Jovell, 1999). However, there is a limit to what healthcare services all citizens have access to. For services not covered by public insurance, citizens must pay for their expenses out of pocket. All citizens engaging in public health systems carry an individual health card (*tarjeta individual sanitaria*),

which can be used to access healthcare across the country (Health Information Institute, 2005). However, unless traveling or in cases of emergency, citizens are required to use their local or assigned healthcare services (Rivero-Bernal, 2012).

Approximately 70% of healthcare costs are paid for by the state, through federal and local taxes (Rodríguez, Gallo de Puelles, and Jovell, 1999). These costs include the benefits mentioned above, hospital and clinic staff salary, and subsidies for roughly 60% of the cost for pharmaceutical medications (Rodríguez, Gallo de Puelles, and Jovell, 1999). Recently, the financing of healthcare system has been strained. Several indicators attest to the general financial shortage of healthcare system. Among these are the variety of medications which have no state subsidization, the high turnover and substantial need for nurses, long waiting periods for surgery, short appointments, and the scarcity of psychiatric and long term hospital beds (Socolovsky, 2009). Moreover, until they were recently banned from doing so, many physicians held two full time positions in order to garner a more substantial salary. Public physicians are usually paid, at least in part, on a per capitation basis¹⁶, while private physicians have different arrangements depending on the insurance company they work with (Socolovsky, 2009).

Summary

In summary, Spanish healthcare is highly decentralized and fairly wide reaching. Federal and local healthcare agencies provide for health from the environmental to the primary care level for all Spanish citizens. Collectively, the healthcare system has a variety of roles, one of the more recent of which has been as a psychotherapeutic provider. Healthcare is jointly financed by the private and public sector, but the system is under-funded and strained. In the next section we examine how cataracts fit into the Spanish healthcare fabric and how cataracts expose different features of the system itself.

III. Cataracts in the Spanish healthcare framework

Similarly to Guatemala, by looking at the role cataracts as a pathology play in the Spanish framework, we can learn about different dynamics of Spanish health and the Spanish state itself. In contrast to Guatemala, Spain maintains high rates of cataract surgery and has a

¹⁶ Based on how many patients they treat.

fairly active and autonomous senior sector. An analysis of cataracts in this setting sheds light on what a positive and uplifting role surgery can have on the life of the individual. Simultaneously, the different challenges Spain faces in regard to cataract surgery illuminate contemporary health obstacles facing the country.

Location and provider

Cataract surgery is subsidized according to the ability of the patient to pay. Patients are often required to pay in part for the operation and almost always required to pay for the lenses. However, the surgery is subsidized by the state to the degree the patient cannot afford the operation, with the ability to afford determined by the state. The procedure is performed in all public hospitals, using the latest technologies (Arteaga 2012). Therefore, the surgery is essentially universally available and in our discussions of the benefits of cataract surgery, we can assume that all individuals are entitled to these benefits. The state ensures that all citizens have coverage for this procedure, and almost all Spanish elderly citizens receive it. The first aspect of cataract surgery within the Spanish system we consider is its ability to contribute towards senior autonomy.

Senior Autonomy

Perhaps the most important feature of high cataract surgery rates in Spain is the degree to which restored vision promotes senior mobility and independence. By looking at the high rates of cataract surgery, and the experiences of patients, we can observe what a healthy, independent senior demographic Spain has. Like the other countries in this study, vision loss is a significant contributor to disability and cataract surgery can offer a promising way to restore independence. As one study which looked at cataract surgery at a national level in Spain observed, “Si en la historia natural de las personas mayores es progresivo el deterioro en su capacidad funcional, los procedimientos para mejorar su salud, como es el caso de la intervención de cataratas, pueden frenar ese declinar¹⁷¹⁸ (López-Torres, López-Verdejo, Otero-Puime, et al. 2004). This is to say,

¹⁷ This same study in the basis for many of the trends considered as we examine senior autonomy.

¹⁸ Our translation: “If the natural development of adults, is the progressive deterioration of their functional capacities, certain procedures to improve their health, as is the case for cataract surgery, can slow this decline.”

that given the natural aging process, it is impossible to completely restore all physical function of the senior demographic, but certain procedures- such as cataract surgery can contribute significantly to the functional capacity of the individual. Below we consider several of the ways in which cataract surgery can support functionality of the individual and creates an active older adult population.

1. Visual Acuity

The ways in which cataract surgery contribute to autonomy are diverse and highly individuated. However, beginning in the simplest sense, one of the clearest benefits of cataract surgery is the recovery of visual acuity:

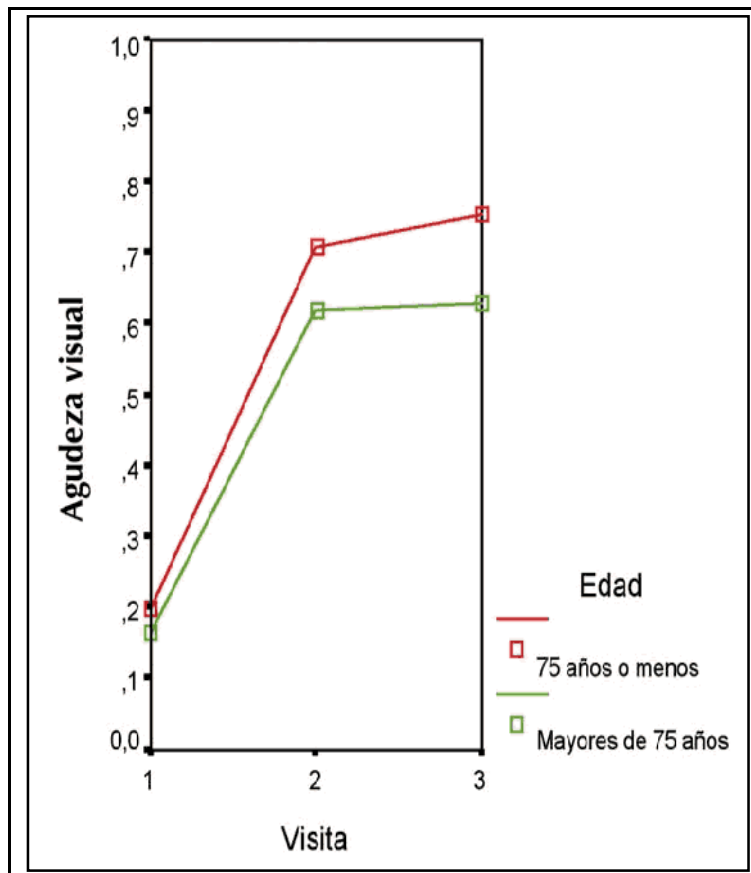


Figure 4. Number of appointments following cataract surgery versus visual acuity for cataract patients in Spain. Visual acuity was measured at three subsequent visits after operation. Source: Cabezas-León, García-Caballero, Morente-Matas. 2008¹⁹

Compared to before surgery, there is almost a fourfold increase in visual acuity for individuals under 75. Cataract surgery offers a clear way to restore vision, often to the point that

¹⁹ Our translation: " y-axis: visual acuity, x-axis: visits to the doctor key: age, red line: 75 years or less, green line: older than 75"

patients no longer require glasses. Whether or not patients use glasses after surgery is dependent on the type of lens they have implanted. For patients who have one lens for near distances and one lens for far distances, or two multifocal lenses, implanted, glasses are usually not necessary. For patients who choose to have either two lenses for near distances or two lenses for far distances, glasses are needed to compensate for the alternative distance. Like all aspects of cataract surgery, the choice of lens, is related to the personal relationship the patient maintains with their vision. Nevertheless, regardless of the type of lens the patient has implanted, cataract surgery significantly restores visual acuity. Additionally, it is worth noting that in our discussion of cataract surgery in Spain, lens choice is a relevant part of the procedure. However, in Guatemala, due to the prevalence of procedures like extracapsular extraction and a general lack of healthcare options, lens choice is much less relevant to analysis of contemporary cataract surgery.

2. Physical Functionality

As a result of the increase in visual acuity, cataract surgery can usher in the restoration of physical functionality for many individuals. After having cataract surgery, individuals in Spain, have reported being able to climb stairs, bathe themselves, dress themselves, and a variety of other functions related to domestic tasks and personal care (Cabezas-León, García-Caballero, and Morente-Matas, 2008). The ability to perform many of these daily tasks reduced the individual's dependence on others and granted them much more autonomy. In general, cataract surgery is associated with an increase in the ability to perform activities of daily living and instrumental activities of daily living (such as feeding ourselves, bathing, dressing; Applegate, Miller, Elam, et al., 1987). This overall increase in agency is fundamentally why cataract surgery is so important for a long and healthy old-age. The physical functions associated with vision are intimately related to senior mobility and independence. When we address issues related to cataract surgery we are simultaneously confronting issues of senior physical autonomy and functionality. As patient testimonials reaffirm, this restoration of physical function is one of the most important factors to evaluate when considering the value of cataract surgery. Therefore, the effects of cataract surgery include both the ability to see and also all of the physical functions correlated with the ability to see.

3. Social Functionality

The restored social functionality of the individual, as a result of cataract surgery, is another way in which this intervention contributes to senior autonomy in Spain. Upon having restored visual acuity and physical function, Spanish individuals have also reported a richer social life. One study found specifically, “Mejoran las relaciones y actividades sociales, en concordancia con la mejoría en las funciones físicas y emocionales” (López-Torres, López-Verdejo, Otero-Puime, et al. 2004)²⁰ The restoration of social functionality is a particularly important benefit of cataract surgery. Social health is important for our mental health and wellbeing. Additionally, social health is correlated with overall biological health. In this way, restoring vision can have positive effects upon the social life and wellbeing of the patient, as well as their overall biological health.

4. Perception of general health

Finally, perhaps the most empowering aspect of cataract surgery is in the combination of all these functionalities towards the production of an increased perception of individual health. In the Spanish studies, individuals say they felt generally healthier and reported an increase in their overall health (not just exclusively visual health) (Cabezas-León, García-Caballero, and Morente-Matas. 2008; López-Torres, López-Verdejo, Otero-Puime, et al. 2004). Self-assessed health is receiving increased attention in all health-related studies and surveys. This metric has been positively correlated with quality of life and is frequently used to predict mortality (Damian, Ruigomez, Pastor, et al. 1999). If we recall the earlier discussion of Sir Michael Marmot's work and the relationship between our perception of ourselves and our health, then perhaps post-op perception of health is related to our perception of ourselves, and is related to stress pathways. Regardless of the mechanism, cataract surgery can change the way in which the individual perceives herself. Rather than locating themselves as a disabled or visually impaired, patients may begin to locate themselves as independent and high functioning. Because of the correlation between health and perceived status, this shift is important for the overall well-being of the individual and reflects on the importance of cataract surgery as a procedure.

In summary, in Spain, cataract surgery is universally available and studies which investigate how this surgery effects the lives of the patients have found largely positive

²⁰ Our translation: “ Relationships and social activities improve as physical and emotional functions improve.”

outcomes. Specifically, cataract surgery has been found to increase the visual acuity, physical functionality, social functionality, and perception of general health of the individual. Although no study has specifically stated that cataract surgery enables a more autonomous and independent senior demographic at the national level, when we consider that cataract surgery is the most frequent surgical intervention and that it is universally available, the implications of cataract surgery are wide-reaching. These findings contrast significantly to the trends revealed in our analysis of cataracts in Guatemala. In Guatemala, inspection of cataracts as a pathology pointed to health disparities and challenges in national development. In Spain, inspection of cataracts as a pathology points to studies which enumerate the multiple benefits of cataract surgery and the many ways in which it contributes towards senior autonomy. In comparing the two countries, we can see how high access to cataract surgery fosters senior autonomy and independence while low access to cataract surgery hinders national development and compromises the well-being of the individual.

Gender

Despite its marked improvement compared to Guatemala, the Spanish healthcare system still has its own challenges, several of which can be observed through an analysis of cataracts as a disease. The first of these challenges we consider is the gender disparity manifest in cataracts. Interestingly, cataract prevalence is higher women than in men in Spain. Although current studies have documented this phenomenon, none have identified a clear causation. As one article from the *Sociedad oftalmológica de España* noticed, there are likely several contributing factors, specifically: “Algunas explicaciones dadas a este fenómeno son la mayor supervivencia por parte de las mujeres, su exposición a factores de riesgo de catarata ligados a la reproducción y diferencias en el acceso y utilización de los servicios de salud²¹” (Acosta et al., 2006).

²¹ Our translation: “Some explanations provided for this phenomenon are the increased survival rate of women, their exposure to risk factors associated with reproduction, and differences in access and utilization of health services.”

Regarding increased survival rates, it can hardly be contested that women live longer than men and, consequently, there is a greater incidence of cataracts in the female population. However, one study recently found that even according to percentages, women still proportionally have a higher prevalence of cataracts (**Fig. 5**).

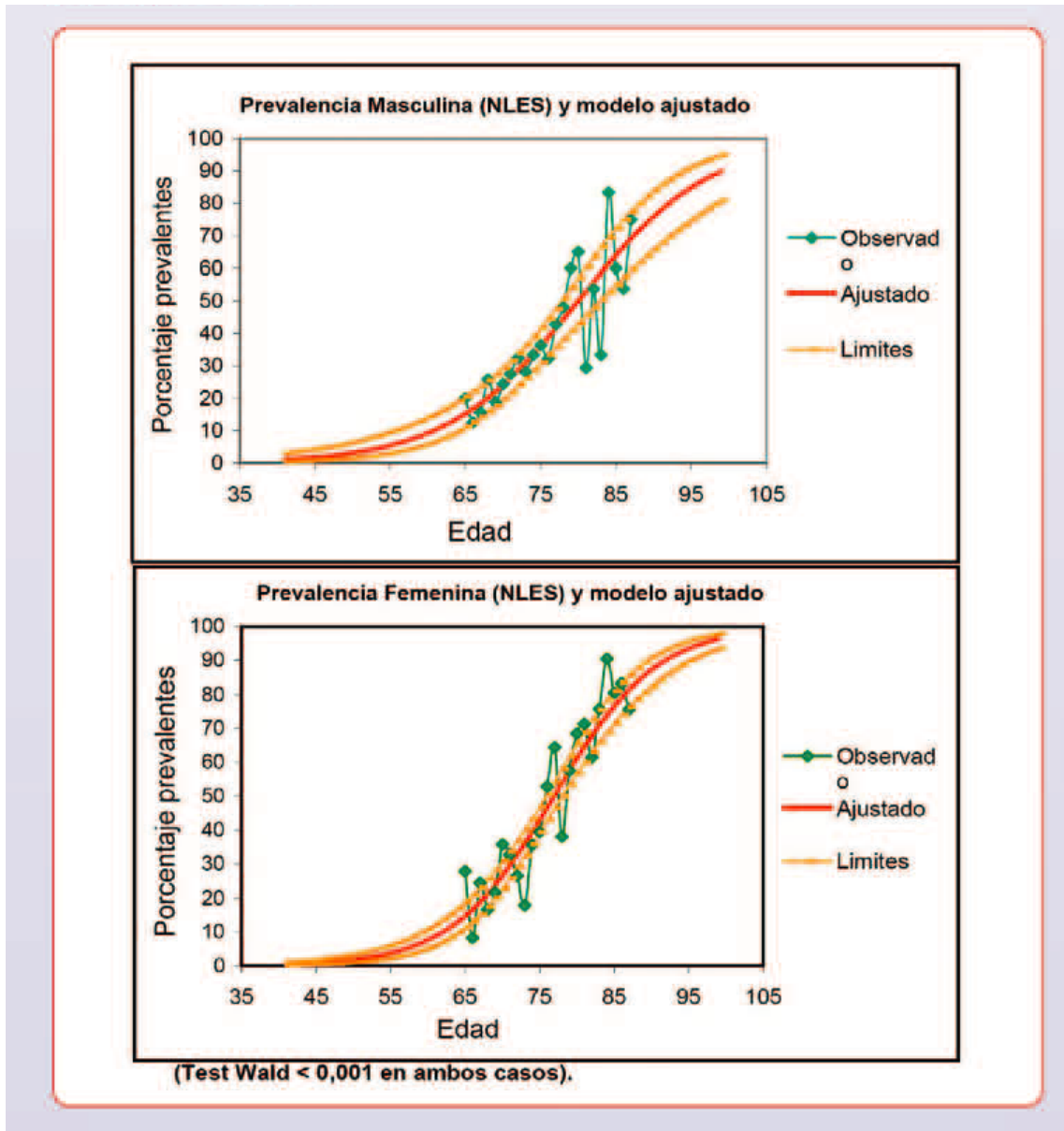


Figure 5. Upper graph represents cataract prevalence versus age for women and lower graph represents age versus cataract prevalence versus age. Source: Roman, Comas, Castelles, et al. 2000.²²

²² Our translation: y-axis: prevalence percentage, x-axis: age, green line: observed, red line: adjusted, yellow line: limits

Therefore, there are other factors accounting for the high prevalence of cataracts besides the sex disparity in life expectancy. Considering risk factors tied to reproduction, recent studies have found that hormone therapies for menopausal women may be linked to cataract development (Kanthan, Wang, Burlutsky, et al. 2010). However, the results of these studies are highly debated and the association between hormone therapy and cataractogenesis is still suspect because there is currently no known biological explanation as to why increased estrogen would be related to the formation of a cataract. Additionally, within the studies which have examined this phenomenon, there exist a large number of confounding factors which make the rate in cataract formation between women who use hormone treatments versus women who do not, unclear.

Because of the proportionally higher rate at which women develop cataracts, and the lack of a concrete biological explanation, it is worth considering the final factor enumerated by the *Sociedad oftalmologica*- underutilization of surgical services by women. The underutilization of cataract surgical services is consistent with other studies in Spain which have observed that men use ambulatory surgical services more than women (Redondo-Sendindo, Guallar-Castillón, Ramón-Banegas, et al. 2006). In this sense, the sex differential in cataract surgery may speak to a larger trend about women's relationship with surgical intervention. The reasons behind why women, at a large scale, are 'noncompliant' or unwilling to undergo surgery is outside the scope of this paper. However, a possible cause worth considering is women's historical relationship with surgery.

As a thoroughly human system, biomedical institutions are never entirely neutral spaces without political agendas. A recent example, are the findings of the Institute of Medicine in the United States, which showed that even when confounding factors such as socioeconomic status, urban versus rural location, and level of education were controlled for, there still existed racial disparities in quality of care across the country (Smedley, Stith, and Nelson, 2003). Similarly, for sex based issues, particularly those regarding reproduction, we can find countless moments of discrimination in the biomedical fabric. One common example is birthing practices when birth became widely hospitalized in during the middle of the 20th century. In the United States, and other developed countries, it was common for the mother to be so heavily medicated that she was incapable of remembering the birth or participate in decisions about the birth itself. This practice

was largely in the name of convenience for the healthcare staff, rather than concern for the mother (Pinto, 2011). Moreover, under the Franco regime in Spain, there existed an infant trafficking industry such that the government was able to promote stratified reproduction, and inhibit many families from undesired social strata to raise their children. Under the Francoist regime, infants were taken from mothers after delivery while the mothers were informed the baby had passed away as part of a patriarchal agenda (Tremlett, 2011).

In these instances, institutional medicine was a vector for societal and individual practitioner values. For much of history, and especially Spanish history, these values have been patriarchal in nature and led to the discrimination and maltreatment of women in medical settings. Historically, women have had oppressive experiences in hospital and surgical settings, as evidenced by birthing practices and infant trafficking (although there exist countless other powerful examples). This is to say, that when confronted with the sex disparity in prevalence of cataracts in Spain, it is worth considering women's collective relationship with surgery and what external factors may be participating in this relationship. No study has yet identified a clear correlation between women's historical relationship with medicine and cataract surgery rates. Additionally, studies in Latin America as a region and Guatemala as a country have explored the possibility of a sex-disparity in operation rates. Although some of these studies have found that women tend to operate less frequently than men, others have not, and the results are on a whole, inconclusive. In general, further research relating to women and surgery is needed to better understand the gender dynamics of cataract surgery in Latin America and in Spain. Nevertheless, in Spain it has been shown that women overall receive cataract-surgery less frequently than men, and given the lack of a sound biological explanation, it is likely that non-biological phenomenon are at work.

Backlog in cataract surgery

Another important challenge of the Spanish healthcare system which cataracts reveal is its saturation. The Spanish healthcare system largely provides for the health needs of the state but it is also strained and under-funded. In order to keep up with its growing population, in particular its expanding elderly population, the Spanish healthcare system must develop and expand to become even more robust. Compared to surrounding European nations and other OECD

countries, Spain spends less per capita on healthcare of its system has a generally less developed healthcare network (OECD 2011).

One of the ways in which this is evidenced is the backlog that exists for cataract surgery. As a state subsidized procedure, and one covered by most private insurance companies, most senior citizens in Spain receive cataract surgery at some point. However, for those individuals covered only by state insurance, the waiting period for cataract surgery can last months or even years. Waiting for such a long time before operating, after the decision has been made that it is time to operate, can compromise the effectiveness of the surgery due to the development of the cataract. Over the course of a few months, cataracts can develop substantially and significantly harden the lens, making the surgery much more difficult. Additionally, during the time the patient is waiting for the operation, they may suffer increased loss of autonomy due to the many ways in which vision is related to independence. In the case of a nuclear cataract, the patient can be rendered entirely blind within a few months. As one study notices,

Si por culpa de las cataratas un paciente anciano corre el riesgo de perder su autonomía para realizar actividades cotidianas, tanto básicas como instrumentales, no debe asistir a un deterioro de sus funciones formando parte de una lista de espera. Una catarata puede y debe intervenir quirúrgicamente tan pronto como sea incompatible con la vida normal del paciente (López-Torres, López-Verdejo, Otero-Puime, et al. 2004)²³

In this sense, because of the connection between autonomy and vision, long waiting times for cataract surgery are problematic. Although the decision to operate is unique for each individual, the patient and physician generally decide to operate once cataracts begin to negatively impact the patient's ability to function. A long waiting time between operation and decision to operate will usually result in further deterioration of vision and decreased ability to function. Therefore months spent waiting for the surgery can compromise the well-being of the individual as they suffer increased vision loss.

The magnitude of this backlog is considerable. According to a recent article in the BBC, “Researchers in Spain recently estimated that the rate of cataract surgery procedures must increase by more than 50% to prevent the current backlog from growing” (Kreatsoulas, 2009).

²³ Our translation: “If an elderly patient risks losing his or her autonomy to perform basic and instrumental daily activities, this deterioration should not be enhanced by being on a waiting list. Cataract surgery should and must be performed as soon as it hinders the normal life of a patient.”

The backlog is likely due to a shortage of ophthalmologists working in the public sector. Indeed, like many specialties in Spain, it is much more lucrative for doctors to work in the private sector, where they have more intimate relationships with their patients and greater agency in their practice. This disparity presents an interesting problem for Spanish healthcare, because one of its great advantages is the existence of a robust private sector. Due to the higher quality of private care, patients who can afford private insurance are incentivized to pay private companies, which relieves part of the burden of the state in paying for citizens who cannot afford healthcare.

However, the state is still clearly burdened and unable to ensure that patients who need access to cataract surgery, and may otherwise become disabled individuals, receive the intervention in a timely fashion. In this moment of economic crisis, it may seem almost impossible for Spain to generate the revenue necessarily to expand its healthcare system so that all of its citizens are adequately covered and do not face the kind of compromises in wellbeing that inadequate coverage (such as a waiting list for cataract surgery) can cause. The backlog in cataract surgery, then, speaks to one of the most pressing issues facing Spanish healthcare- the financial strain on the system amidst an increasing need for the system to provide and to expand.

IV. Benefits and challenges of surgery rates in Spain

Evidently, cataract surgery speaks to and substantiates broader trends in Spanish society, in particular, in Spanish healthcare. Cataracts map onto several key features of Spain such as senior autonomy, gender differential in usage of healthcare services, and financial strain. In addition to considering what this procedure reveals about Spain, we also consider why Spain should continue to make cataract surgery a priority and what role the intervention will play in Spain's future.

Like Guatemala, the Spanish older adult population is large and expanding. If fertility rates continue at their current rate (although they are expected to decline), 28% of the population will be 60 years or older by 2025 (UN, 2012). When identifying key challenges in the Spanish healthcare system, ophthalmologist Ángel Arteaga identified the aging of the population, saying “España es el segundo país del mundo con la tasa más alta de vida después de Japón, ello conlleva un aumento de enfermedades geriátricas, tratamientos y fenómenos de dependencia.

España es un país envejecido en este aspecto.”²⁴ With the aging of the population as such a central health issue, cataracts, and their associated benefits and challenges, will also becoming increasingly important.

National Economic Burden

Like Guatemala, insufficient cataract surgery rates (afforded by long waiting times rather than inaccessibility) has national economic consequences. With such a large elderly sector, the backlog in cataract surgery is exerting financial strain upon the system. One study found that based on the number of patients who would be willing to pay for one month reduction in their waiting times; Spain was losing approximately \$15 million dollars annually in consumer surplus (Stuckler, 2008). This is to say that Spain could profit substantially by reducing waiting times for cataract surgery (WTCS) for patients who are willing to pay for a decreased waiting period. However, until the system expands to operate on these citizens who would pay, there will continue to be a surgical backlog. This same study found that the costs associated with waiting times represented roughly 10-25% of the total cost associated with cataracts nationally (Stuckler, 2008). Considering that cataract surgery is the most frequent surgical intervention in the country, these costs are a serious economic concern and they speak to the underfunding of the healthcare system. Indeed long WTCS are characteristic failures of countries with social healthcare systems with limited resources (Stuckler 2008). The current backlog can be expected to grow and, “dado que el envejecimiento es cada vez mayor y la generación del baby boom llegará en los próximos 10 años a su cénit de jubilación , hay que prever que en un futuro el número de procedimientos de cirugía de catarata aumentará notablemente creando problemas de sostenibilidad económica”²⁵(Arteaga 2012). In this moment of economic crisis, reducing waiting times seems to be an efficient way to garner capital from the private sector. Therefore, when we consider why cataract surgery is important and what effect it has in Spain, the effect it has upon the economy is one of the most important.

²⁴ Our translation: “Spain has the second longest life expectancy in the world after Japan, which correlates with an increase in geriatric diseases, treatments, and dependency. In this sense, Spain can be considered an aging country.”

²⁵ Our translation: “Considering that more people are living longer, and given that in the next ten years the generation of baby boomers will reach its peak of retirement, it is likely that the number of cataract surgeries will increase substantially, thus creating problems of economic sustainability.”

Role of the senior population

Despite the current economic problems cataracts pose, unlike Guatemala, in Spain cataracts do not appear to be a major contributor to disability or a threat to the well-being of the individual. In general, cataract surgery is a widely available and successful procedure. Social security covers the procedure for all patients who request it, and it is almost always preformed with the latest technologies. In addition, primary care facilities are equipped to perform regular visual examinations. Because of the high quality of primary care and the high level of coverage throughout the country, patients are usually referred to the ophthalmologists once cataracts begin affecting visual acuity. Patients are generally knowledgeable of the procedure and able to access it due to their high level of interaction with their healthcare systems

Because of this quality in care and high rate of cataract surgery, this intervention helps contribute towards senior autonomy at a large scale. Although no studies have explicitly linked cataract surgery to a collectively active national demographic, when we consider that it is universally covered, the most commonly performed surgical intervention, and positive the results of studies which look at different cohorts of individuals, this link is evident. The increase in visual acuity, physical functionality, social functionality, and perception of health all point to the large scale positive effects this procedure has on Spanish society. In consequence, the major benefits of cataract surgery can be observed in all the positive effects they have towards the autonomy of the elderly population in Spain.

V. Summary

Cataracts as a reflection of Spanish society

In this section, we have considered the multifaceted reality of cataracts in the Spanish state, examining what cataracts as a pathology illumine about their setting. The high rates of cataract surgery contribute towards an older adult population with restored vision and the multiple benefits correlated with restored vision. As a universally available and widely performed procedure, Spanish seniors maintain high levels of visual health, and all the corresponding facets of health associated with vision. Despite this largely positive image of cataract surgery, certain features of the procedure also map onto significant challenges and

problems within the system. Although the reasons behind a gender differential in surgery rates are inconclusive, women develop cataracts more frequently than men, yet collectively undergo operation less. This discrepancy is immediately problematic in so far as it means that cataracts are going untreated. However, looking through a broader lens, it may speak to difficulties that women have interacting with the Spanish medical system at large. Finally, the backlog in cataract surgery shows that the system is underfunded and needs to expand.

Implications of cataract surgery

We also considered why cataract surgery is so important for Spain. Long waiting times are exerting significant costs upon the system, which can only be expected to grow with the expanding elderly demographic. Additionally, cataract surgery is important because it is so highly beneficial to the senior population. The multiple ways in which cataract surgery contribute to the wellbeing of elderly demographics speak to the relevance of this procedure towards quality of life and autonomy.

Solutions

Confronted with need for expansion of surgical services, in conjunction with lack of funding, Spain finds itself in a somewhat similar position to Guatemala. Both states need to develop their healthcare systems internally in order to meet the needs of its population, in particular for cataract surgery. In Guatemala, there is evidence of ethnic stratification in cataract surgery, while in Spain there is evidence of gender stratification in cataract surgery. In Guatemala, there are sufficient surgical providers amidst an underutilization of the system. In Spain there are insufficient surgical providers amidst a saturation of the system.

In this moment of economic crisis, when Spain is actively voting about its healthcare policies, it may be valuable to consider the Guatemalan example of how destructive low rates of cataract surgery can be both nationally and individually. In the final section we consider a collective analysis of all three states and what each can learn from the others health praxis in order to successfully manage cataracts in the future.

Cuban Healthcare and Cataract Surgery



An announcement for a Cuban run hospital in Honduras. Source: Izaguirre-Godo, 2011.

I. Overview

As a country that is developmentally between Spain and Guatemala, cataract surgery rates are also comparatively higher than in Guatemala but lower than in Spain (Limburg, Silva, Foster, 2009; Comas, Román, Cots, et al. 2008). Indeed, much of Cuban healthcare seems to be characterized by a certain intermediacy and to evade simplistic binaries such as socialism versus capitalism, weak versus strong, or developed versus underdeveloped. In this section we consider cataracts in the Cuban setting and examine this intermediacy. Again, we first analyze healthcare history, modern structure, and contemporary trends. We then employ cataracts as a more concrete and local example of these larger trends, using the disease as a way to learn more about Cuban society itself. Finally, in addition to using cataracts as an acute manifestation of broader dynamics, we consider the importance of the procedure. Specifically, we analyze the unique aging of the Cuban population and how cataracts represent a particularly important pathology in

the Cuban demographic and economic framework.

II. Cuban Healthcare History

Overview

Confronted with the sharp contrast in level of health between Cuba and every other developing nation in the world, it is difficult not to exalt Cuban healthcare as many aid organizations, academics, physicians, authors, and governments have. Much of this praise is warranted considering that Cuba shares similar health metrics with the healthiest nations in the world, including infant mortality and infectious disease burden (see annexes). The high success of Cuba in its efforts to provide healthcare both nationally and abroad, has led some academics to make sweeping claims about socialism as the most effective governing model and statism as the remedy to health inequalities (Chomsky, 2000, Aviva, 1997, Kidder, 2003).

However, throughout its history, Cuban healthcare has received a large degree of criticism internally, throwing into questions the validity the unilateral praise of outsiders. Moreover, the Cuban economic structure has been evolving and redefining itself dramatically over the last 20 years, such that the labels like 'socialist' or 'capitalist' may be insufficient to describe the Cuban financial climate. The history of health in Cuba is complex, and it evades simplistic economic and cultural binaries. In our analysis of Cuban healthcare, we focus on how this system transcends such dichotomies and the reality of Cuban healthcare.

Cuban healthcare and the Castro Regime

Cuban healthcare began as one of the first initiatives of the Castro regime. Since the government's foundation, universal healthcare has consistently been a priority for Cuba. The three governing principals since 1959 for healthcare have been: universality, equitable access, and government control (Spiegel and Yassi, 2004). The first few years of the government were characterized by dramatic health reforms such as the creation of MINSAP (*Ministro de Salud Pública*), Act 723 (which increased rural access to primary care), mass vaccination campaigns, and the first international medical aid initiative in Algeria. During the 70's and 80's Cuban healthcare greatly expanded to become one of the most developed and efficient systems of its time (MacDonald, 2008).

Perhaps the most important movement of this time period was the ideological and

practical shift towards family medicine and primary care. In addition to making family medicine a specialty, Cuba passed two “Five Year Plans” for healthcare expansion. The first of these required doctors to spend time serving rural populations and promoted widespread medical education, greatly increasing the number of doctors. The second further expanded medical facilities, education, and access. Both plans highlighted medical literacy among the population, focusing on education campaigns and preventative care. The campaigns of the government to educate its citizens about their health and to familiarize them with the multiple ways to access healthcare services, is now considered one of the driving forces behind Cuban's high levels of scientific and medical literacy. During these decades, Cuba achieved levels of public health comparable to developed nations and constructed a truly universal system (MacDonald, 2008; Mesa-Largo, 1982).

The end of the 80's was one of the more controversial periods of Cuba's healthcare history. Cuba was increasing its research, expanding biotechnology, and developing a robust pharmaceutical industry. However, the HIV/AIDS epidemic ushered in an aggressive effort by the state to control the spread of the virus. HIV/AIDS testing was mandatory and citizens who tested positive were forcibly quarantined for months. Although Cuba now has the lowest rate of HIV/AIDS in the world, the forced quarantine of patients who tested positive has drawn wide criticism from human rights campaigns (MacDonald, 2008).

The 90's were a period of great transformation for Cuban healthcare. Between the collapse of the Soviet Union and the introduction of several United States embargo laws, Cuba was plunged into a state of poverty and resource shortages. In 1991 The Cuban government announced that “socialism was under siege” and declared a “Special period in time of peace” (*el periodo especial*) (Brotherton, 2008). The Cuban Democracy Act (1992) and the Helms-Burton Bill (1996) were explicit attempts by the United States to extinguish the Cuban declining economy, and to “give [Castro] a final push over the brink” according to U.S. Senator Jesse Helms (Bearden, 2011). As a pharmacological and biomedical giant, the United States was, and still is, the sole supplier of several key medications and technologies. Because of U.S. embargoes, physicians and pharmacies were unable to supply patients with necessary medications and the government was unable to provide sufficient nutrition to the population (Brotherton, 2008). As a result of the deficiency in medication and nutrition, the special period was a time of several public health crises. The most notable of these were an optic neuropathy

epidemic²⁶ as a result of nutritional deficiencies; an outbreak of the Guillain-Barré²⁷ syndrome caused by lack of chlorination chemicals; and an epidemic of lye ingestion in toddlers due to severe shortages of soap. These wide-reaching and immediate effects of the embargo have prompted international discussions about how “economic sanctions may have an unintended but profound effect on the health and nutrition of vulnerable populations” (Barry, 2000).

Cuban healthcare and the modern economy

Faced with resource shortages, a starving population, and a collapsing government, Cuba pulled itself out of the special period in a way that fundamentally challenged and changed what it means to 'develop'. Although Cuba has a long history of international medical aid, during the special period it began to truly develop medicine as an export and as an industry (Medical Education Cooperation with Cuba, 2012). Cuba made several pivotal changes in its foreign investment structure in order to allow foreign medical investment and develop its own robust biotechnological and pharmaceutical industries. One of the most important changes was the introduction of hard currency, the dollar (Brotherton, 2008). The integration of hard currency allowed for foreigners to pay for many medical services in a more affordable way, namely by making the dollar to peso exchange rate 1:1 for foreigners and by accepting dollars themselves as a form of currency. It also increased the value of remittances received by Cubans from relatives in Cuba (BBC, 2011)²⁸. As a result of the dollarization of the economy, as well as the changes in foreign investment structure, the Cuban economy grew significantly. By the 1999, 98% of the country was covered by a neighborhood “doctor-and-nurse” program and the country began to regain its previous high levels of public health (see annexes) (M EEC, 2012; Barry 2000). Currently Cuba has the highest doctor -to-population ratio in the world (5.91 per thousand), life expectancies of 76/80 years for men and women respectively, an infant mortality rate of 6/1,000, and a maternal mortality rate of 53 per 100,000 births (WHO, 2011).

²⁶ Optic neuropathy is the atrophy of optic nerves, which causes vision to dim and reduces the field of vision. The ability to see fine detail is lost, and colors seem faded. The pupil reaction to light will diminish and may eventually be lost (A.D.A.M. 2012).

²⁷ Guillain-Barre syndrome is a serious disorder that occurs when the body's defense (immune) system mistakenly attacks part of the nervous system. This leads to nerve inflammation that causes muscle weakness. (A.D.A.M. 2012)

²⁸ Throughout Cuban history, remittances have been a source of income for Cubans, however they were fairly modest in their impact upon the Cuban economy. Once the economy was dollarized in 1993, remittances became, “one of Cuba's largest sources of foreign currency earnings, as important as the country's export income and revenues from tourism” (Barbería, 2002)

Cuba was able to fund these domestic improvements, and much of its economy through its international medical trade (Spiegel and Yassi, 2004). In 1998, Cuba launched its “Comprehensive Health Program” which was designed to generate sustainable health models for underserved populations in Latin America. One of the most lucrative Cuban health exchanges facilitated through this program has been the “doctors for oil” trade established with Venezuela, which precipitated true growth of the Cuban economy. In addition, Cuba has restored diplomatic relationships with several Central American countries through the Comprehensive Health Program. This medical commerce is collectively known as *Salud y Turismo C.A.* And it represents a primary source of funding for the Cuban government and for the Cuban healthcare infrastructure (McKinley, 2007; Medical Education Cooperation with Cuba, 2012). Indeed, commercialized medicine has redefined the Cuban economy itself. As anthropologist Sean Brotherton observes: “Nowhere were changes to Cuban socialism more evident than in the launch of the country’s ‘health tourism’ industry, *Salud y Turismo S. A.*, in the mid-1990s. This signaled the emergence of (...) ‘socialist entrepreneurs’” (Brotherton, 2008).

However, Cuba is still a developing country with a very low GDP. Cuba, then, presents a unique country profile: the public health profile of a highly developed country and the economic profile of a developing country. These coexisting profiles challenge conventional definitions of poverty. In Guatemala, a low income directly correlates to lack of access to healthcare, and correspondingly high rates of disease burden, disability, and mortality. In Cuba, low income individuals have easy access to primary care and generally have a long life expectancy. This Cuban anomaly illuminates a new modality for development. As one study noted, “Cuba challenges the idea that generating wealth improves health (which may explain why some choose to ignore this reality)” (Spiegel and Yassi, 2004). Rather than aggressive growth of manufacturing, transportation, and other sectors traditionally associated with industrialization, perhaps healthcare represents the contemporary pathway for national development. As Amartya Sen notes in his book *Development as Freedom*, “Growth of GNP or industrial incomes can, of course, be very important as *means* to expanding the freedoms enjoyed by the members of the society. But freedoms depend also on other determinants, such as social and economic arrangements (for example facilities for education and healthcare)” (Sen, 1999). This is to say that while industrial expansion of GNP can be, and historically has been, the method to develop and to alleviate poverty, there are also other methods. In the case of Cuba, expansion of

healthcare is such an alternative method.

The fundamental lesson of Cuban healthcare history is that a dedication to health can generate a functioning economy and sufficient income to provide primary care to a population. If we think of poverty as suffering, rather than a discrete financial metric, then Cuba certainly has taken great strides to pull itself out of poverty. Moreover, it has done so in a way that challenges the traditional polarizing vocabulary used to describe Cuba. The economic modifications made by the government during the special period were liberalizing, but the state can hardly be described as capitalist. In this way the Cuban financial climate evades the polarizing labels of “capitalist” versus “socialist, and is better described by “the coproduction and coexistence of different forms of capital, whether centralized or dispersed” (Brotherton, 2008). Similarly, Cuba shares several important features of a developed country (perhaps the most important features) while it also shares defining aspects of developing countries, and, as a result, it also evades the diametric opposition of “developed” versus “developing”. In the next section we explore how contemporary Cuban healthcare operates and how it too transcends yet another simplistic binary of “good versus bad.”

III. Modern healthcare structure

Given the high level of government regulation in health publications, and the explicit state agenda of broadcasting Cuba as a healthy and successful nation, it is difficult to extract opinions and perceptions of public healthcare which have not first passed through the state filter. Notwithstanding official government claims, the commentary of Cuban physicians, academics, and patients suggests that the modern healthcare structure is a fundamentally two-tiered structure, segregating and privileging foreign consumers over Cuban citizens. This dual medical economy is due in large part to the dollarization of the Cuban economy, under which certain medications (including Cuban made pharmacological products) and interventions are only available through the dollar. It is also influenced by the diversion and drain of resources towards Cuba's international medical commerce. However, despite this recent problematic dynamic, Cuba generally provides wide-reaching and quality primary care. In this section we investigate both the positive and negative aspects of Cuban healthcare by examining national healthcare coverage, the business of healthcare, and individual navigation of the healthcare system.

National Healthcare Coverage and Quality

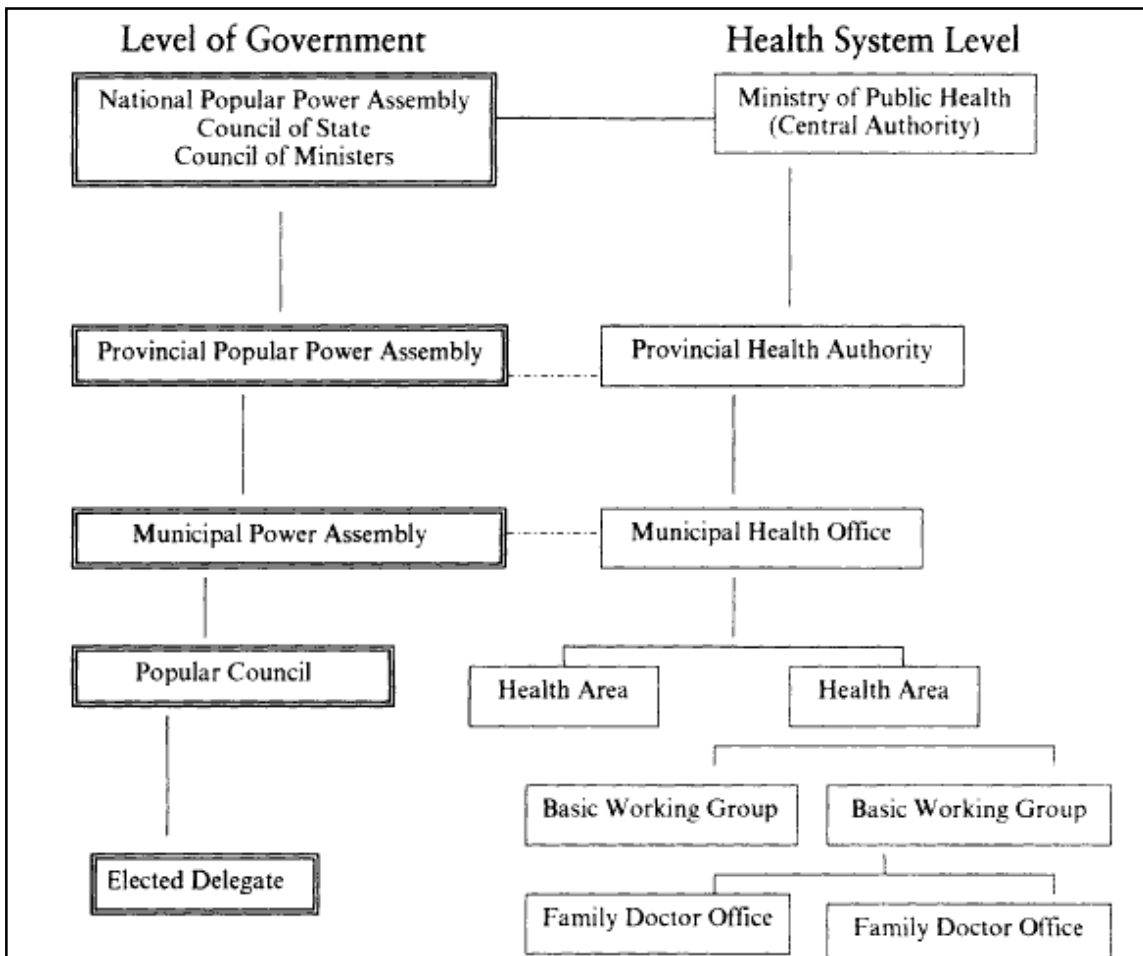


Figure 6. General structure of the Cuban healthcare framework correlated with the parallel government framework. Source: Spiegel and Yassi, 2004.

Despite the problematic two-tiered dynamic, Cuba has an efficient and well-evolved network for providing primary care to the entire country. The fundamental operating unit of the system in the *consultorio* (family doctor's office), which is a small local health center provided to every neighborhood and community. *Consultorios* are staffed by at least one nurse and one physician, who are expected to make regular house visits in addition to running the *consultorio*. The advantage of the *consultorio* is that as such a small functioning healthcare unit, it can be established in more rural and difficult to access regions. In addition, the high emphasis on regular check-ups and preventative care decreases the cost of expensive emergent interventions on the system.

Consultorios refer patients to *policlinicas* which are larger health centers and the next most important functional unit of Cuban healthcare. *Policlinicas* then refer patients to hospitals or specialized medical facilities like eye surgery centers (Pesant, 2012). All citizens have access to these facilities and basic coverage. In addition, Cuba institutes several different health campaigns and programs. One particularly effective program has been the *Círculos de Abuelos*, where “las personas de la tercera edad encuentran un espacio para intercambiar con sus iguales. Además, desarrollan actividades sociales y culturales con el objetivo de mejorar la calidad de vida de sus miembros” (Pesant, 2012)²⁹. The *Círculos de abuelos* provide elderly citizens with exercise routines and social activities, helping to keep this sector of the population active and healthy.

In summary Cubans enjoy universal coverage of primary care, which is financed almost entirely by the State (Spiegel and Yassi, 2004). The high level of public health afforded by this extensive primary care is the major triumph of Cuban national healthcare. From the *consultorio* to the *circulos de abuelos*, Cuba has in place several key infrastructures to support the health of its population.

1. The business of healthcare

We now turn to an analysis of Cuba's international health industry, the emergence of the dual medical economy, and what implications this commerce has domestically upon Cuban health. Since the revolution Cuba's service to the developing world has been a key feature of its international relations. Beginning in 1960, over 100,000 Cuban health professionals have served in 101 countries and Cuba has educated over 21,000 international medical students (excluding nursing and other health professions) (MEEC, 2012). Regionally, Cuba's Comprehensive Health Program (CHP) was developed in the late 90's to respond to natural disasters in Central America, but since then it has expanded to include most of Latin America (MEEC, 2012). The efforts of these programs have been highly effective in-country. Health status improves markedly in areas of Cuban medical relief: for example in Guatemala the infant mortality rate has dropped from 45 to 16.8 deaths per 1,000 births in Cuban staffed areas. Moreover, international medical practices

²⁹ Our translation: “Elderly persons find a place to interact with their peers. They also develop social and cultural activities in order to improve their quality of life.”

bear Cuban philosophy of “population-based public health principles and prevention” (MEEC, 2012). The introduction of these concepts has been key to actualizing sustainable development of healthcare infrastructures and productive dialogue with local organizations and cultures. In addition to benefits for the areas of Cuban medical relief, these efforts have been enormously important towards the resurrection of the Cuban economy. In fact, it was the introduction of Cuban medical relief (in particular ophthalmological services) with Venezuela which allowed for the Cuban-Venezuelan oil exchange so crucial to Cuba's economic recovery. Similarly, Cuba's exportation of medical aid has re-opened trade with several Central American countries. Consequently, Cuba's international medical presence is integral to the state's ability to function, and as a result, to provide healthcare domestically (Brotherton, 2008).

However, another key tenant of Cuba's international medical operations is its provision of services to wealthy foreigners who come to Cuba for substantially cheaper medical interventions, participating in the modern phenomenon of “medical tourism”. Medical tourism is a large part of what informed the decision to introduce hard currency in the mid-nineties, allowing tourists to pay for their interventions and medications in dollars. Yet the Cuban state still operates on the *peso*, which means that anyone employed by the state (roughly 85% of the population) does not have access to the dollar (Burnet, 2011). This has created a *doble moneda* (double money) economy under which the dollar is elusive and privileged. The combination of the *doble moneda* economy and the diversion of resources to international Cuban aid efforts puts Cuban citizens at a disadvantage as they try to access healthcare resources and has led to a sense of outrage and marginalization among Cuban consumers (Brotherton, 2008).

In the advent of medical tourism, several clinics and pharmacies have opened up practices available only to foreigners or those with dollar purchasing power. Some pharmacies require a foreign passport to purchase medications, a trend increasingly problematic as local *consultorios* are consistently short on essential pharmaceuticals and vaccines. Similarly, several healthcare facilities and interventions are exclusive to foreigners or to dollars. Cubans themselves have difficulty accessing dollars because there are a limited amount of dollars circulating and Cubans are required to pay a higher exchange rate than foreigners for pesos to dollars (BBC, 2011). Consequently, given that, “peso and dollar economies are, for the most part, mutually exclusive, one operating for the welfare of the people and the other as a savvy profit-making enterprise” it is not surprising that many medical professionals are de-incentivized from working within state

healthcare (Brotherton, 2008),. Doctors abroad receive much better pay and benefits, such as the right to buy a car when they return to Cuba (McKinley, 2007). Cuban primary physicians complain that they are, “generally expected to work for moral incentives rather than for monetary compensation, that is, to be good *revolucionarios*.”(Brotherton, 2008).

When we consider the Cuban healthcare system holistically, it can evidently provide basic primary care to all of its citizens, which has had enormously positive effects on public health. But the system is financed by a two-tiered hierarchy which leaves Cuban citizens unable to access important medications, vaccines, and procedures. It drains both physical and human medical resources from the economy and leaves Cubans with inferior care compared to both the medical tourists and the beneficiaries of Cuban aid. This inferiority in care has given birth to a new way for Cubans to navigate their healthcare system. In the following section we examine how people are compensating for the two-tiered medical economy and how this compensation informs their relationship with healthcare.

2. Individual medical agency

A key feature of the Cuban medical framework, perhaps its most distinguishing feature in comparison to Guatemala, is the biomedical agency enacted by Cuban citizens. In response to increasingly elusive medical services, individuals have begun operating within a system known collectively as *lo informal* (the informal). *Lo informal* represents all the regular non-government approved transactions Cubans participate in, such as the black market, small private business, network-based commerce with *socios*, and *jinetismo*³⁰. Medically, *lo informal* manifests itself in attempts to gain dollars or foreign passports in order to access health products and services. Citizens regularly bribe physicians or other healthcare providers, wait outside clinics and pharmacies for foreigners to walk by to perhaps purchase their medications for them, or exchange dollars for pesos under the table (McKinley, 2007). The agency engendered through the widespread transactions of *lo informal* is further supplemented by the high level of medical and scientific literacy among the pueblo. Cubans are “inundated with biomedical knowledge” and have abundant access to physicians (Brotherton, 2008). As a result, they have been described as a population that very much takes its health into its own hands, often quite successfully.

³⁰ *Jineterismo* is traditionally prostitution, but it can refer more broadly to hustling in general.

Because of this success, it seems as though the government, while not actively sanctioning *lo informal*, is dependent upon its operations. Cubans ability to access privatized medical care, even if it is through illegal mechanisms, further finances that system, which in turn generates profit for the state. Thus, the high level of biomedical agency of the Cuban individual is a large contributing force which allows the state to function. It also is a unique feature of the country which distinguishes it internationally, especially in comparison to Guatemala and Cuba.

In synthesis, the modern Cuban healthcare structure is marked by three distinguishing features: extensive and quality primary care, a *doble moneda* economy, and biomedical agency of the consumer. These features become more apparent when we focus on one pathology, in this case, cataracts. In the next section we examine how cataracts situate themselves into the Cuban healthcare framework and how they embody much of the national health dynamics enumerated above. As with Spain and Guatemala, we use cataracts as a disease to observe national health trends at a more concrete and a more local level.

IV. Cataracts and Cuba:

Of all the health challenges confronting Cuba, cataracts as a disease quintessentially embody the nature of the Cuban system. Like primary care, all citizens have access to cataract surgery and the procedure is covered by the state. However, also like many health interventions, cataract surgery is negatively impacted by the dual medical economy.

National coverage: Location and Provider

Beginning with the comparison to primary care, cataract surgery is subsidized by social security, so theoretically no individual requiring cataract surgery has to pay for it (Hernández Silva, Marcelino Rio, Padilla Gonzáles, 2005). Moreover, foreigner studies report that Cuba has essentially eliminated preventable blindness on the island (Qing, Haiyng, and Baili, 2010). Indeed, in 2004 there were less than 700 ophthalmologists in Cuba and in 2010 this number rose to 2,000, an impressive number for a population of roughly 12 million. Similarly, the number of cataract surgeries increased from 10,800 in 2000 to almost 15,000 in 2003 (Vision 2020). This is to say that the procedure has been expanding, especially in the last decade. Overall, Cuba is known for having high levels of ocular health and fairly extensive coverage of cataract surgery

(Qing, Haiayng, Baili, 2010). In this sense, cataract surgery is provided essentially the same way as primary care; in fact, it could be argued that it constitutes part of primary care under the Cuban system. Like the rest of primary care, cataract surgery is generally available and has correspondingly positive health metrics in regards to cataract-caused blindness. In this way, cataract surgery serves as an example of the success of the Cuban health system, in particular the primary care system.

International coverage

The international provision of cataract surgery models another key feature of the Cuban healthcare system: its existence as an industry and commerce. Internationally, providing cataract surgery as a trade has been integral to Cuban international relations and the development of the economy. Regarding the important diplomatic ties forged through medicine, in particular concerning Venezuela, cataract surgery and ophthalmological services in general are figure-heads of such efforts. The primary initiative encompassing Cuban ophthalmological assistance and trade is titled *Operación Milagro* (Operation Miracle), a joint health venture established with Venezuela aimed at providing free ophthalmological services to countries in need. Venezuela has been the primary beneficiary of this effort, where over a million Venezuelans have received free Cuban care. However, *Operación Milagro* operates in over 74 countries and most of these are in Latin America (Conner, 2009). Accordingly, the Cuban government is providing and subsidizing this operation for hundreds of thousands of people regionally and beyond (Conner, 2009). The results have been lucrative both economically and diplomatically as Cuba is able to exchange these services for resources and re-forge ties with its neighbors. This success closely parallels the greater trends observed in Cuban international healthcare in the sense that successful international commerce is helping to develop the economy. Therefore, cataract surgery is representative of the commercialization of Cuban healthcare; in fact, it is one of the procedures which have been key towards the construction of healthcare as an export. In this way, another important feature of Cuban healthcare is manifest in cataract surgery and shows how larger trends are enacted at a more specific level.

International versus national coverage disparities and conflicts

Nevertheless, like most aspects of the Cuban healthcare structure, the mix of foreign consumers (both medical tourists and aid recipients) into the framework has led to lesser quality of care and compromises of the system. For cataract surgery, this is manifest in two distinct ways: the compromise in care for recipients of aid for cataract surgery and diversion of resources away from Cubans in need. Regarding aid recipients, in Cuba's efforts to provide mass cataract surgeries, healthcare staff and patients have noticed that the system is overloaded. In addition to traveling abroad, *Operación Milagro* also flies foreigners to the island for the operation, and these foreigners face compromised quality care in Cuba's efforts to provide as many surgeries as possible. One New York times reporter found that in providing surgery as part of *Operación Milagro*, "Physicians are sacrificing quality for quantity as they hurry to complete as many operations as possible" and found "the number of eye operations at [a Cuban hospital] has soared from about 15 to more than 120 daily, and many patients fail to receive important preoperative tests" (Marx, 2005). This is to say that of the foreigners who are receiving free Cuban cataract surgery, in Cuba, many may be facing a compromised quality care as the state tries to provide as many free surgeries as possible. Because cataract surgery is traded, particularly for oil, the government stands to benefit from a large volume of surgeries.

In addition to the economic benefits driving a high volume of surgeries and compromising quality of care, another factor accounting for the saturation of the system is the shortage of doctors relative to the number of operations needed. In general, "The corps of doctors and nurses left in Cuba are stretched thin and overworked, resulting in a decline in the quality of care for Cubans"(McKinley, 2007). This seems to also be the case for cataract surgeries, where surgeons are performing high volumes of surgery, disproportionate to the normal surgeon to surgery ratio. Ophthalmologists appear to be facing staff and resource shortages as they attempt to treat a tidal wave of foreign patients in need. Accordingly, there is true stress on the system resulting from domestic doctor shortages. This shortage is a central problem and key feature of Cuban healthcare as doctors migrate internationally. Therefore, the compromise in care for cataract surgery serves an example of the problems and conflicts than can arise from Cuba's commercialized healthcare. In this case, it is the recipients of Cuban aid receiving their operation in Cuba, who are facing the negative aspects of industrialized healthcare. Additionally, Cubans themselves are also negatively impacted by the exportation of

cataract surgery.

More specifically regarding cataract surgery for Cubans, although cataract surgery is universally covered, not all Cuban citizens are even aware it exists and do not operate. One study that examined cataract surgery in Cuba found that, “la falta de conocimiento acerca de la disminución de la visión por catarata y sus consecuencias y la poca información acerca del momento adecuado para los procedimientos quirúrgicos fueron barreras importantes referidas en Cuba”³¹ (Hernández Silva, Rio Torres, Padilla Gonzáles, 2005). The lack of information regarding vision loss due to cataracts and its consequences, and the limited information regarding when to operate, were significant barriers observed in Cuba.

Cuba is much more similar to Guatemala than to Spain in this sense. Even though the country has a developed ophthalmological healthcare framework, there remains a lack of information about the procedure and it is not accessed by those who stand to benefit (and who the state would cover). This discrepancy in Cuban quality of care versus international aid and commerce elucidates the problematic nature of the two-tiered medical system. Cuba is a country which has in large part restored its economy because of its ophthalmological services in Venezuela and Latin America. And yet, while over 1 million Venezuelans have received free Cuban eye surgery, Cuba's own citizens have difficulty accessing the intervention, in fact, they may even be unaware it exists (Conner, 2009).

Those who are aware of this discrepancy express the common resentment at healthcare system failure. The consistent presence of foreign aid recipients (although they may face compromised care) makes the disparity between international and national healthcare all the more obvious. As one report found, “Some Cubans express resentment at the resources being poured into *Misión Milagro*³², complaining that foreigners get better medical treatment than they do. Other Cubans seethe as they watch foreign patients driven to and from hospitals in new Chinese luxury buses while they wait for hours for scarce public transportation” (Fox News, 2011). This national resentment could also be said to be both a problematic and a characterizing feature of the dual medical economy. Cataract surgery epitomizes foreigner privilege because it is readily provided free of cost to hundreds of thousand non-Cubans, while Cubans themselves receive inferior care from the state.

³¹ Our translation: “The lack of awareness of cataract-reduced vision, its effects, and the limited information regarding the appropriate time for surgical procedures were significant barriers found in Cuba.

³² Synonymous with *Operación Milagro*.”

However, as stated at the beginning of this section, Cuba generally has high levels of ocular health among its population and has essentially eliminated preventable blindness. Although knowledge of the procedure is a key barrier between Cubans and the procedure, the percentage of Cubans who are unaware is fairly low compared to other Latin American countries- 4.4% of all total cases (compared with 68% in Guatemala)(Limburg, Silva, Foster, 2009). The comparison may make this number seem insignificant, but considering the prevalence and the growth of the older adult population (as we do in the following section), 4.4% of seniors unaware of the procedure represents a large number of people who are suffering from blindness which is preventable. Therefore, when looking at cataract surgery, and cataract surgery as a representative of the healthcare system itself, it is important to create a balanced image. The Cuban state should be held accountable for foreigner privilege, and for compromising cataract surgery quality with foreign aid recipients, as well as among its own population. Cuban citizens have legitimate complaints against the state for so willingly providing free surgery to outsiders before ensuring that its citizens are aware of the procedure and providing quality treatment. At the same time, social security covers the procedure and Cuba has very low rates of cataract-caused blindness relative to other countries in the region, namely Guatemala (Limburg, Silva, Foster, 2009).

Therefore, cataract surgery ultimately comes to represent one of the most important features of Cuban healthcare: its duality. Cataract surgery shows simultaneously the extensive coverage of primary care, the compromises in quality that can be made from commercializing healthcare, and foreigner privilege. Collectively, all of these features of cataract surgery demonstrate that Cuban healthcare is not an ideal system, as countless Cuban and external reports promulgate. Nor is it a bad system, to the contrary, it largely meets the healthcare needs of Cuba. The Cuban healthcare system is a functioning two-tiered apparatus, under which citizens both receive quality healthcare and simultaneously find this quality compromised by the very structure of the framework.

IV. Benefits and challenges of surgery rates in Cuba

As with other countries in this study, we have examined how cataracts map onto several key features of Cuba and Cuban healthcare such as quality primary care and foreigner privilege.

Equally as important as considering what this disease can tell us about Cuba, is considering why Cuba should continue to make treatment a priority and what challenges cataracts pose to the future of Cuban healthcare. The first of these we consider is the increase in cataract development as a result of the systematic aging of the population.

A unique aging of the population

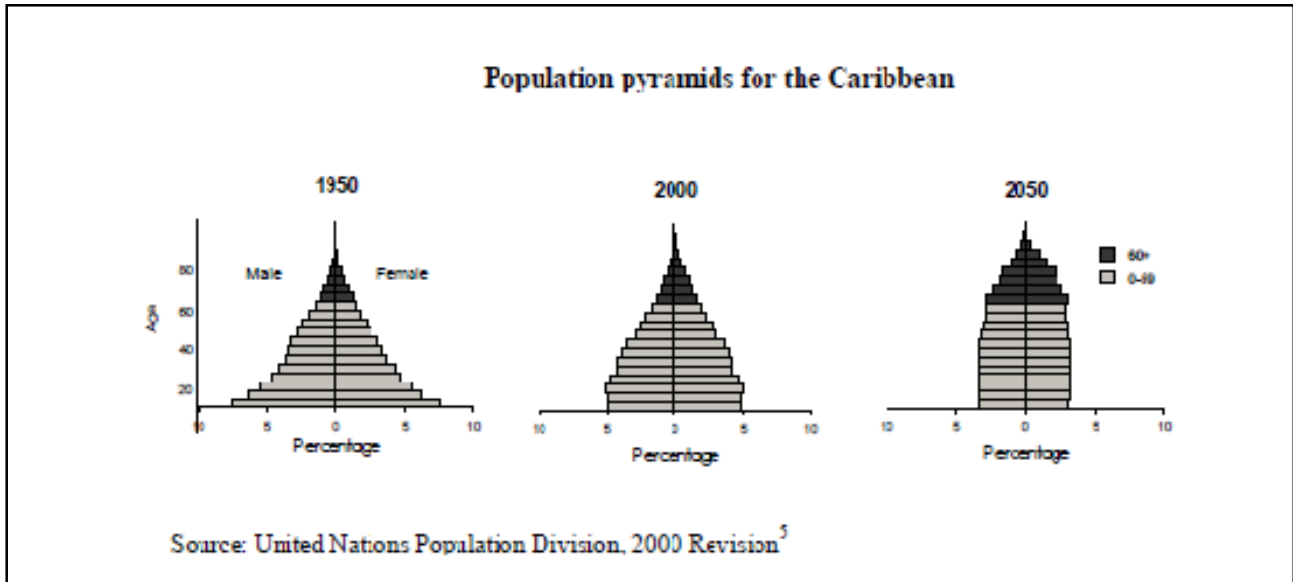


Figure 7. Population Pyramids for the Caribbean for 1950, 2000, and 2050.

As part of what is defined as “Latin America”, Cuba is one of the countries in the fastest growing region in the world and of these countries, Cuba is aging the fastest (Mas, 2011). The *Oficina Nacional Estadística* (National Statistics Office) predicts that by 2025 the average age in Cuba will be 44. Other studies have found that even in 2010, the elderly population was greater than the number of Cubans under 14, and represented a total of 17.8% of the population. As shown in the table below, Cuba can expect roughly a 65% increase in its population over 50 in the next 13 years.

Table 3. Proportion of population over 50 for Cuba. **Source:** Limburg, Silva, Foster, 2009

Country	2005 (%)	2010 (%)	2015 (%)	2020 (%)	2025 (%)	Increase (%)
Cuba	25.3	27.6	32.3	37.6	41.6	64

This is a tremendous increase, and it represents a serious challenge to Cuban health and social infrastructure. Because of this increase, the dependency ratio is expected to increase 3 to 4 fold by 2025. Moreover, unlike most other countries facing such growth of the senior demographic, Cuba does not have an immigrant population to offset the proportional decline of the working adult demographic. In fact, Cuba actually has a negative net migration rate of -4 migrant(s)/1,000 population (U.S. Census Bureau, 2012).

With the knowledge that cataracts are a part of the biological process of aging, in addition to the Cuban commitment to paying for cataract surgery, the government will face a large increase in the amount of money it needs to invest into cataract surgeries. Therefore, healthcare and cataract-surgical costs need to be expanded if the state wants to continue to provide primary care throughout an individual's life. Although the Cuban healthcare industry has been successful in generating a functioning economy thus far, the huge imbalance between the aging population and the rest of the population will create an unprecedented drain on public services like healthcare and social security.

The fact that the aging of the population represents such a serious problem for the Cuban state points to one of its fundamental weaknesses: a greater rate of emigration than immigration. A net emigration rate likely has multiple economic consequences, but one of the most emergent of these is the inability to support the aging population and their surgical costs. These costs represent an immediate problem which could jeopardize the growing Cuban economy. Whether through a shift in culture or in policy, it is in the economic interest of the state to increase immigration rates in order alleviate the high cost of providing care and providing surgery for the elderly

In synthesis, as a state-subsidized procedure and a necessary health intervention for the elderly, cataract surgery represents part of the rising medical costs the Cuban state is facing. Given the high imbalance between the aging and the working population, exacerbated by net emigration, these costs represent a major obstacle to Cuban economic development and most likely require a restructuring of the policy, including more open borders. Because of its unique aging of the population, Cuba should continue to make cataract surgery a priority as it will represent a necessary intervention for an increasingly large sector of society.

The impoverished elderly

Another factor which points to the need for expansion of cataract surgery is the impoverishment of the Cuban elderly. In this respect, Cuba is more similar to Guatemala. Because Cuba is still in poverty in many regards, the Cuban senior sector does not generally have enough income for cataract surgery to be an easily affordable procedure. There are several different unique features of Cuba which contribute to the impoverishment of the elderly and which necessitate an effort on the part of the state if it wants to expand cataract surgery. The first is the widespread lack of pension or private retirement accounts, due to the fact that for most of the last century the majority of Cubans were employed by the state. This is still largely the case and it sets up a dynamic where the elderly, after working for the state, become dependent on the state for their retirement. In this way, the socialist economic policies of the Cuban state directly play into the impoverishment of the senior demographic. These policies are problematic in the sense that unlike Spain, where a portion of the senior demographic is able to pay for privatized surgery and generate capital, elderly Cubans are much less able to afford cataract surgery. The Cuban senior sector is largely in poverty and essentially dependent on the state for medical interventions (U.N., 2003). Therefore, the older adult population is not only growing at an unprecedented rate, but it is entirely reliant on the state for its medical costs, such as a cataract surgery. Because this procedure is provided by the state, if Cuba wants to continue its high rates of cataract surgery, it needs to dramatically expand cataract surgical programs.

Moreover, this expansion must occur in an economically sensitive way for cataract surgery to be widely accessible. In general, the elderly poor have a difficult time accessing medical resources, which is due in part to the lack of infrastructure and development of the Cuban state. As one report of Cuba found, “Regardless of free access to healthcare, the high cost of drugs and the lack of adequate public transportation systems prevent many, particularly the elderly poor, from using it.”(U.N., 2003) This is to say, that elderly Cubans are not always able to use or access the medical resources they require. One recent study found that “one out of every two elderly Cubans ‘feels fear or uncertainty’ about their health and economic situation. In rating their standard of living according to their incomes, 60 percent of those polled spoke of ‘deprivations’ and a lack of resources” (Fox News, 2011). This is to say that senior Cuban demographic, faces resource shortages and health shortages are among these (despite the state

subsidization of many medications and procedures). This means that in addition to expanding cataract surgical services, the accessibility of services should also be expanded. As a surgical procedure, cataract surgery requires transportation. Like Guatemala, transportation may represent a barrier between elderly, disenfranchised Cubans and their healthcare services. Additionally, there is a small yet significant portion of the population that is unaware that the surgical procedure exists. Accordingly, in its expansion of cataract surgery, Cuba needs to bear in mind the economic condition of its patient-consumers. The economic hardships faced by the elderly necessitate the expansion of information about cataract surgery and increased accessibility of the procedure as well as simple volumetric expansion of the intervention itself.

In summary, when considering the implications and the future of cataract surgery in Cuba, its needed expansion is evident. If Cuba wants to maintain its high levels of visual health and low levels of preventable blindness, cataract surgical services need to be expanded dramatically considering the unique aging of the population. In particular, Cuba needs to expand cataract surgery due to the rate of growth of the senior demographic, their dependence on the state, and their collective poverty levels. Cataract surgery also needs to be expanded in a way cognizant of the economic condition of the Cuban elderly.

V. Summary

Cataracts as a reflection of Cuban Society

In Cuba, as in Guatemala and in Spain, we can detect features of society and healthcare trends by examining cataracts as a disease in the Cuban setting. By taking an acute approach, and looking at one exemplary disease, we can garner concrete examples of broader patterns. In this way, the focus on one pathology in particular allows for tangible illustrations of larger and more abstract Cuban phenomenon. For Cuba, cataract surgery reveals several important forces at work. Specifically, cataract surgery serves as an example of the generally sufficient and wide-reaching nature of Cuban primary care. It also sheds light upon the negative outcomes of a commercialized medical industry; namely, compromised quality of care for aid recipients and lack of accessibility for Cubans themselves. These findings are consistent with more comprehensive trends such as the simultaneous emergence of a broad primary care base and a *doble moneda*, two-tiered medical economy. Together, all the features of cataract surgery in Cuba

reaffirm the importance of recognizing the system for its complexity and dynamism.

Implications of cataract surgery

In addition to employing cataracts as a vector for social analysis, we also recognize the relevance of this procedure towards the Cuban state. Besides its value as case-study pathology, cataracts also represent a defining feature of the future of Cuban health. If the Cuban state wishes to continue to provide the high level of primary care which has defined its success, particularly the reemergence of its economy after the special period, cataract surgery must be expanded. The expansion on the part of the state is particularly relevant for Cuba because its senior demographic is growing remarkably fast and in unusual disproportion to working age demographic. Additionally, most of its elderly are entirely dependent on the state for healthcare and so if cataract surgery is going to be expanded in a way consistent with Cuban universal healthcare values; it requires a large national investment. However, given the economic condition of recipients of cataract surgery in Cuba, this expansion must be not only volumetric in nature, but also take into account transportation and awareness barriers between Cubans and the surgery.

Solutions

Confronted with need for expansion of surgical services, in conjunction with a largely developing economy, Cuba finds itself in a somewhat similar position to Guatemala. As a country with universal healthcare coverage, which is dependent on the state for expansion of primary care, Cuba is also in a somewhat similar position to Spain. Guatemala serves as an example of the enormous burdens a state can incur when citizens do not have access to cataract surgery. Meanwhile, Spain serves an example of the highly autonomous senior population that can develop when citizens do have access to cataract surgery. If Cuba, then, considers jointly the example of these two countries, the need for expansion of services becomes more evident. Additionally, unlike Guatemala, Cuba already has a primary healthcare framework established, so the questions it faces regarding improvement are more related to policy and how to govern the structures already in place. In the following section, we examine what types of policy may be most successful in planning for the expansion of cataract surgery. More broadly, we examine how the collective analysis of all three states can be used to determine which guiding concepts are most relevant to solving the cataract dilemma common among Spain, Cuba, and Guatemala.

VI. Discussion

Country Comparison: future expansion of cataract surgery

When we consider cataract surgery as an intervention in Spain, Cuba, and Guatemala, the determining factor for surgery rates is not the affordability of the procedure. Citizens in each country turn to this procedure according to their relationship with biomedicine and with the state. A superficial comparison of Spain and Guatemala alone may appear to suggest that as a simply wealthier country, Spain is better able to provide cataract surgery at a wide scale. However, close inspection of the barriers Guatemalans identify between themselves and cataract surgery, considered jointly with the high rates of cataract surgery in the comparable economic climate of Cuba, this is not the case. Indeed, even in the first-world setting of Spain, we can perceive the importance of the individual's relationship with medicine as a determinant in accessibility of cataract surgery. Although women are comparatively more burdened by cataracts in Spain, they seek the procedure at a lesser rate than men, pointing again to presence of other driving forces besides purely economic ones.

The fact that this procedure is not defined solely based on its pricing corroborates one of the tenants of this study: features of disease are features of society. In each setting, inspection of cataracts as a pathology have pointed to larger trends of the setting. In Spain, cataract surgery revealed the benefits of an autonomous older adult population and the presence of a gender gradient in ambulatory surgery. In Cuba, cataract surgery exposed a functional but two-tiered medical economy. In Guatemala, cataract surgery communicates the oppressive ethnic differential in healthcare services. What this means, is that for systems and individuals looking to expand cataract surgery in each country, the ties between this intervention and society must be taken into account. Cataract surgery, indeed any healthcare intervention, is moored to society and exists in web of history, politics, and culture. With this relationship in mind, we now turn to the future of cataract surgery to consider what guiding concepts are most relevant to expansion, for each individual country, as well as how Cuba, Guatemala, and Spain can productively participate in each other's healthcare frameworks.

Guatemala

One of the most essential differences between Cuba and Guatemala is the relationship the individual maintains with medicine and with the state. In the case of Cuba, citizens have a closer relationship with the state and a great deal of biomedical knowledge and agency within the system. As evidenced by their engagement in *lo informal* and high levels of medical literacy, Cubans are able to navigate biomedical terrain in a way that people in Guatemala do not. As one Cuban anthropologist observed:

The implementation of public health programs provided the state with quantifiable means, such as the decreasing infant mortality rate and increasing life expectancies at birth, by which to measure success and bolster domestic and international recognition of the revolutionary achievements of the state. The gradual development of these public health services was historically influential in defining and reshaping a more intimate relationship between the individual and the state. (Brotherton, 2008)

This is to say that the Cuban state's dedication to universal healthcare, and tangible results, garnered a different relationship between the patient-citizen and the state-provider. In Guatemala, a greater effort on the part of the state to reach out to marginalized populations may also cultivate greater levels of public health and an more productive relationship between the “the individual and the state.” As a country with a limited amount of capital, struggling to maintain stability on so many economic fronts, it may appear unpractical to simply recommend that Guatemala invest money it may not have to develop a more robust healthcare system and a more intimate relationship with its citizens. Moreover, it may seem unrealistic to use Cuba as an example for any country that does not want to dramatically socialize its healthcare system. However- to what extent is Cuba truly an anomaly? Costa Rica also has a similar GDP to Guatemala, and a life expectancy of nearly 77 years (the same as Cuba). Indeed, there is a wide range of GDPs that correlate to long life expectancies (**Fig.8**) This graph, and the Cuban example, exhibit how there is no necessary link between national economy and public health. A broad range of GDP's can correlate to a life expectancy over 70. As Robert Evans notes, “If increasing wealth is the highway to better health – a number of countries seem to have misplaced the map” (Evans, 2008).

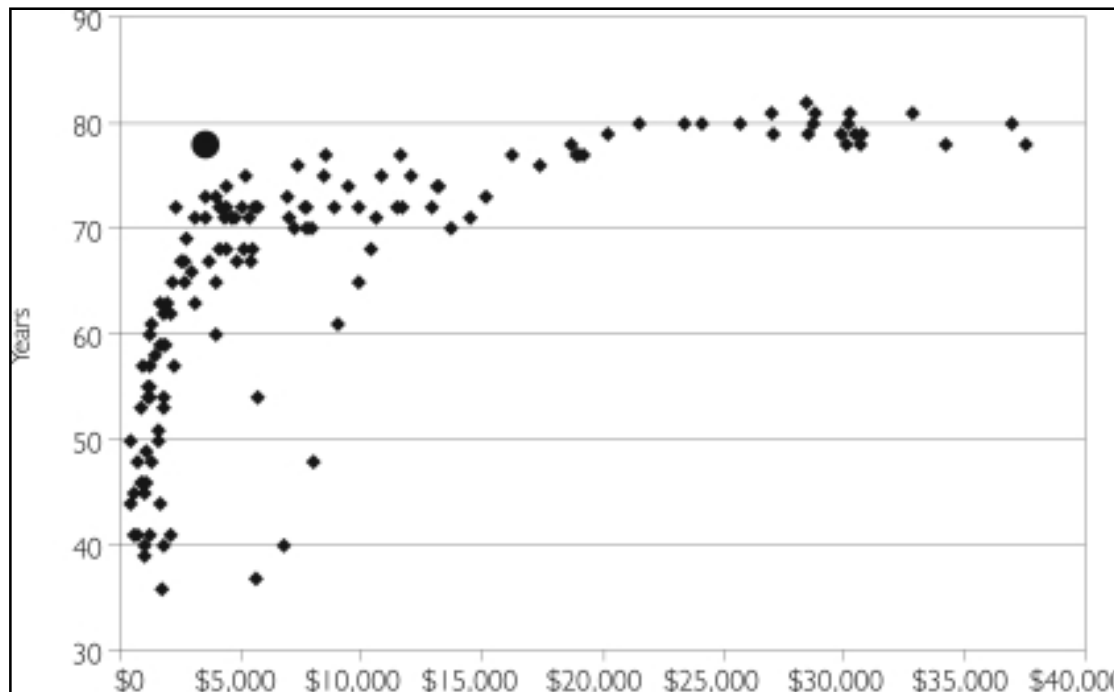


Figure 8. GDP versus life expectancy for 31 countries. The largest black spot represents Cuba. Source: Evans, 2008

This trend is substantiated by phenomenon observed at the local level when cataract surgery is inspected in Guatemala. In the case of this intervention, there are clearly non-cost related barriers between marginalized individuals and surgery. In our in-depth analysis of all the multiple challenges citizens face in accessing this intervention, financial conditions only represented a small part of a much larger and much more complex picture. This speaks to the concept of “underutilization” in studies investigating ophthalmological services reported in rural Guatemala. In essence to view financial shortages as the primary deterrent for cataract surgery would strip the intervention of its cultural moorings. The major difference between Cuba and Guatemala with regards to health and cataract surgery is not strictly an economic difference, but rather related to the presence of an indigenous population. The historically oppressive relationship between Mayan citizens and medicine is a driving force differentiating Cuba from Guatemala.

Indeed, Cuba's own health efforts in Guatemala have been vastly more successful than the Guatemalan government because of their acknowledgment of this dynamic. Under *Operación Milagro*, over 23,000 Guatemalans have received cataract

surgery, subsidized entirely by the Cuban government. Cuban workers recognize that “beyond geographical barriers to health are still tougher cultural challenges when reaching indigenous populations” (Gorry, 2009). As one report of the Cuban presence in Guatemala stated “Rather than attempting to supplant centuries-old traditions, (...) doctors work alongside traditional healers to ensure integrated, culturally-appropriate care” and that “developed collaborative relationships with traditional healers, leads to more effective patient education and case management”(Gorry, 2009). Organizers of this project have cited their collaborative approach as a key determinant for success. Accordingly, Guatemala can turn not only to the Cuban medical practice in Cuba, but to the Cuban medical practice in Guatemala as powerful examples towards the importance of the relationship between the individual and biomedicine.

Therefore, for those interested in expanding and improving the Guatemalan healthcare framework, in particular through expansion of cataract surgery, true progress cannot be made until the discrimination towards indigenous populations and Mayan medicine is addressed. If Guatemala wishes to pull its population out of poverty, and improve its levels of public health, it must cultivate a greater level of respect for its most marginalized citizens. It is in this need for greater respect that the concept of “the state” should be deconstructed. The government, healthcare administration, NGOs, and cataract surgeons are comprised of individuals and the way these individuals relate to patients determines the success of their efforts and of health improvement initiatives. As anthropologist Sean Brotherton notes, “Scholars must address state power not as a monolithic function but as a proliferation of strategies that shape individual experiences. This approach enables exploration of how everyday practices culturally constitute the state as a dispersive network of multiple actors, institutions, and bureaucratic processes.” (Brotherton, 2008). All of the actors compromising Guatemalan healthcare, from the official state actors, to biomedical doctors working with indigenous populations, to United States volunteers, need to take responsibility in their “everyday cultural practices” when reaching out to and working with indigenous citizens.

Guatemala's medical framework has already made progress in this direction. With the increased incorporation of Mayan medicine into medical schools and local level medicine, indigenous populations are remolding their attitudes about biomedicine and there is increased interaction between Mayan communities and biomedical facilities. For cataract surgery this

increased dialogue has been especially productive in the case of Cuban medical assistance. There are enough ophthalmologists, enough surgical facilities, and enough capital, both on the part of the state but also on the part of the patient, to expand cataract surgery. What is lacking is the ability of biomedical institutions to address, or at least to respectfully coexist with, the spiritual and social needs of Mayan patients. In order to expand cataract surgery *Promotores de salud* should continue to learn about Mayan medicine and to promote awareness of the surgery to elderly indigenous individuals and their families. Similarly, eye camps should be cognizant of how inherently oppressive their structure can be, especially when they are operated by foreigners. The individuals running these facilities should also make the effort to engage with and learn from the Mayan medical tradition. Summarily, all actors involved in Guatemalan cataract surgery need to cultivate a collaborative approach between Mayan medicine and biomedicine in order to foster expansion.

Spain

Guatemala's success is not only in the interest of Guatemala. Spain is already invested in the country's welfare, as it actively funds Cuba's *Operación Milagro* in Guatemala, and it stands much to gain from continuing to support Guatemalan development. In fact it was Spain's investment in Latin America which helped the county grow its economy for much of the 1970's. Prior to the 1970's, Spain shared many characteristics common to the less developed countries of Latin America such as a low per capita income and a largely agriculture based economy. In fact, in 1958, Spain's per capita income was less than that of Cuba, Argentina, and Venezuela and much closer to that of Mexico and Guatemala (Baklanoff 1996). The lifting of U.S. Sanctions in 1960 is likely the greatest single contributor to Spanish economic growth as it facilitated Spain's increased participation in the world market, particularly in Latin America. By 1981 Spain had half of its investments abroad in Latin America, which played a large part in the growth of the Spanish economy as a truly robust and global force (Baklanoff 1996).

In recognition of this lucrative relationship, Spain tried to reorganize and redefine its international relations with Latin America in the following decade. Significantly, the nation tried to abandon notions of *madre-patria* and cultivate the concept of *hermandad* in its Latin American economic relations. One important example of this philosophy shift was changing the name of the Spanish government agency in charge of Latin American relations from the Institute

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of Hispanic culture to the *Instituto de cooperación iberoamericana* (Institute of Iberoamerican collaboration). A particularly important moment for the redefinition of Spanish relationships in Latin America was the quintecentury 'celebration' of Christopher Columbus's arrival to the region in 1992. From 1991 to 1992, Spain increased its investment in Latin America nine-fold. Major Spanish corporations like *Telefónica*, *Banco Santander*, *RENFE*, and large airlines moved to Latin America. Spain moved into the Cuban economy and represented one of the few international trading partners which kept the nation afloat during the special period. Many of these economic dealings were accompanied by treaties of “friendship and collaboration” between Spain and the respective countries. These strategic economic moves were followed by intellectual and cultural movements as well. Spain established a new research institute, *Centro España de Estudios de America Latina* (The Spanish Center for Latin American Studies), a program for the preservation of Iberoamerican Historic Centers, and the Cervantes Institute³³. Collectively, all of these efforts have expanded the Spanish economy and point to the large gains Spain has to make from developing its relationship with Latin America. In general, Spain's contemporary economic relations appear to be non-exploitative and mutually beneficial (Baklanoff, 1996).

As Spain struggles with its national economy, a saturated healthcare system, and finds itself with long waiting lists for cataract surgery, the historically productive economic relationship with Latin America should continue to be developed as a source of revenue. With healthcare becoming increasingly commercialized, and as an active contributor to Cuba's *Operación Milagro* (in Guatemala and other Latin American countries), Spain could follow Cuba's lead and export healthcare abroad to Guatemala. Trading healthcare for resources, and more importantly for the diplomatic relations Spain is so aggressively seeking, could be equally as lucrative for Spain as it has been for Cuba. Spain also stands to benefit from the reverse relationship. Spaniards already travel to Guatemala for discounted cataract surgery in centers like *Visión Integral*. With more citizens traveling abroad for surgery, the Spanish state would bear less of the cost associated with the procedure. In essence, Spain's supported development of a Guatemalan ophthalmological framework would relieve part of the strain on the Spanish system. This is to say that promoting Guatemalan cataract surgery jointly represents a solution for both Guatemala and for Spain.

³³ The Cervantes Institute is a globally operating non-profit designed to teach Spanish language and culture.

However, just as the Guatemalan state must remedy the marginalization of its Mayan citizens if it wants to truly expand healthcare and cataract surgery, so too, must Spain recognize the oppression of indigenous groups if it wants to benefit from economic and healthcare trade. As the Cuban presence in Guatemala illuminates, sustainable progress and successful implementation of procedures like cataract surgery is contingent upon collaboration with local individuals and communities. Rigoberta Menchú summarizes this notion in her remarks on the quintecentury celebrations and the forging of a Spanish-Latin America relationship, stating, “Our people's oppression must end before we can aspire to a true encounter of two cultures” (Menchú, 1992). Although many other countries, including the Guatemalan state itself, have represented the most recent forces oppressing and marginalizing Mayan peoples, “first it was the Spaniards” (Menchú 1992).

It was a defining moment in Guatemalan history, when the Spanish Fray Bartolome de las Casas, haunted by the genocide and eventual extermination of all indigenous peoples in Cuba, came to Guatemala and enacted the labor reforms necessary to ensure the survival of the Mayans. These political reforms were at once beneficial, in that they secured the survival of the indigenous, and oppressive, as they secured the Mayans socioeconomic repression. As evidenced by Menchú, many indigenous peoples are aware of this history, and recognize its role in establishing an ethnically stratified national hierarchy. This is not to say that the Guatemalan state itself is a colonial victim, and not responsible for the suffering and discrimination of Mayan people. Rather, it means that if Spain wants to continue to forge the diplomatic relations it has been pursuing with Latin America, whether as a commercialized healthcare exchange focusing on cataract surgery, or otherwise, it must do so cognizant of history. Just as all of the actors under the Guatemalan state need to cultivate respect and collaboration with Mayan people in their 'everyday cultural practices', so too should Spanish diplomats, ophthalmologists, and medical tourists. More concretely, this means providing aid in much the same way Cuba has, by collaborating with, rather than trying to supplant, Mayan medical structures and practices.

Domestically, Spanish healthcare is characterized by its psychotherapeutic nature, which enables a healthy and productive relationship between patients and biomedicine. This aspect of Spanish healthcare represents a potentially valuable contribution in the Spanish-Guatemala exchange. If Spanish healthcare workers in Guatemala, present and future, can continue to practice a truly psychotherapeutic biomedicine, they could help promote the kind of ideological

shift regarding biomedicine which is crucial to public health in Guatemala. In this respect, Guatemalan healthcare stands to learn and to benefit from the Spanish example. As a country which was not unlike Guatemala economically 50 years ago, the psychotherapy of healthcare marks an important distinction between the two countries (similar to the more comparatively more intimate relationship Cubans have with biomedicine). The success of psychotherapeutic practices reiterate the greater need for recognition of Mayan healing practices and culture. Indeed Mayan medicine, which takes the patients holistic needs into account, is also psychotherapeutic in nature. A complimentary medical approach, which employs both medical models, but always upholds the jointly valued psychotherapeutic needs of the patient, is a promising way for Spanish biomedical care and local Mayan medicine to expand cataract surgery.

In synthesis, Guatemala and Spain alike stand to benefit from the expansion of cataract surgery through collaboration with Mayan medicine. As a country burdened by all of the disabilities associated with preventable blindness and a growing senior demographic, the benefits of increased cataract surgery are evident in Guatemala. Close inspection of cataract surgery reveals that what is truly necessary for expansion is not simply volumetric growth, but rather the harnessing of already existent ophthalmological resources through the fusion of alternative and biological medicines. Such a harnessing requires all actors to respectfully engage with and empower indigenous citizens in medical settings. Expansion could be further promoted through Spanish collaboration, which represents a mutually beneficial solution. As a country which has historically benefited economically from trade with Latin America, is looking to forge ties of *hermandad* in the region, and finds its own healthcare system strained, the Spanish supported development of Guatemalan healthcare represents a promising way to meet national needs. Both through the development of the private sector, where Spanish citizens can receive discounted surgery and alleviate the healthcare costs of the state, and the public sector, where Spain can trade healthcare for resources in a manner similar to Cuba, increased collaboration could yield much needed capital. However, this collaboration must be cognizant of Spain's historically oppressive role in the region, which still affects the opinions of indigenous people today. Again, healthcare expansion will be most productive if it empowers marginalized citizens and integrates Mayan medicine.

Cuba

Cuba is already benefiting from healthcare collaboration with Spain and with Guatemala, and it appears to be implementing cataract surgery collaboratively with local health institutions abroad. However, Cuban citizens still face healthcare disparities in comparison with foreigners such as inequalities in access and information. As the older adult sector grows, Cuba can expect a situation similar to Spain, in which there is a high demand for cataract surgery and a backlog on the procedure. As a country in poverty, Cuba can expect a situation similar to Guatemala if this procedure isn't made available to its citizens. Accordingly, just like Spain and Guatemala, Cuba needs to expand its coverage of cataract surgery.

Because the medical tourist industry has been so crucial to Cuba's economy and its ability to provide care domestically, the increased development of healthcare commerce is a logical way to continue to grow Cuba's economy. As in the case of Guatemala, further Spanish investment in Cuban healthcare could help relieve some of the cataract surgery burden in Spain while simultaneously bolstering the Cuban economy through medical tourism. Indeed, Spanish investment in Cuba and Cuban healthcare has been integral to Cuba's growth and success since the revolution. Similarly, Cuba's expansion of its healthcare services abroad appears to be a mutually beneficial and lucrative practice for Cuba and other countries in the region. The development of ophthalmology programs in South America and in Central America seems to be a valuable way for Cuba to continue to grow its diplomatic presence and access resources regionally.

However, the growth of the healthcare industry, whether through foreigners traveling to Cuba for services, or Cubans traveling to provide services, should not continue at the expense of Cubans themselves. Cuba seems to have little to gain from making its privatized medical care inaccessible. Making medications only available in dollars, or keeping dollars themselves elusive seems to erect an unnecessary barrier between Cubans and the medical industry. If Cubans are willing and able to pay for privatized services, they could contribute to funding the sector of the economy which is most crucial to growth. Requiring a passport in order to access necessary medical resources engenders a needless apartheid in healthcare. Cubans should be allowed to pay for any medical services they can afford. As is evidenced by the collective practices of *lo informal*, the problem is not that Cubans can't pay for the medication, the doctor visit, etc., it is that they must access them in an underhand way. Although many Cubans receive dollar

remittances from the United States, dollars still remain elusive as a currency to many other Cubans because of the artificially increased exchange rate they must pay. In order to allow all Cubans to access privatized medical care, foreigners should be charged just as much as Cubans to exchange pesos for dollars or Cubans should be able to exchange dollars for pesos at the same 1:1 exchange rate as foreigners. Regardless of whether Cubans are paying less or foreigners are paying more, the exchange rate for dollars to pesos should be the same for everyone. Allowing Cubans access to dollars will facilitate their participation in the private sector, something which will ultimately relieve part of the burden of the state and help Cubans look after their own health and wellbeing.

In the case of cataract surgery, if Cubans who wanted private surgery could easily access it, the burden on the state would be lessened. As the case of Spain elucidates, when there is a large backlog in cataract surgery, amidst citizens who would be willing to pay in part for the procedure, capital is lost. In order to avoid this dilemma as the Cuban economy grows and as the senior demographic mushrooms, the privatized medical economy should be opened up to Cuban consumers. Because of economic liberalizations, the following generation of elderly will have substantially more resources than the current generation and will be able to pay for private care (which they already are doing illegally). Therefore, in addition to developing its presence in Guatemala and its exchange with Spain, Cuba should remove the partitions between its private medical economy and its citizens.

Cataract Surgery

Evidently all three countries continue to be intertwined in each other's development. In the case of cataract surgery, these connections have the potential to be productive as each country seeks to expand the procedure. Furthermore, although the three countries find themselves in different medical climates, the need for expansion of cataract surgery represents a unifying characteristic. The fact that cataract surgery is becoming so important in each settings points to the emergence of a new demographic era. At the national level, aging has been traditionally regarded as a problem only of wealthy and developed countries, and yet, as Cuba and Guatemala so powerfully demonstrate, there is now a global, impoverished, elderly. We are now are in an age where we must readjust our concept of lifespan, as the human experience becomes universally characterized by aging. Our new-found longevity will be followed by philosophical,

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ethical, economic, and political debates and changes in policy. These discussions represent much of contemporary and future research and are likely to be an on-going and multifaceted discourse. Yet as we make the confusing and challenging transition into a globally, aging society, there are certain adjustments which can and should be made more easily than others, and cataract surgery is among these. Cataract surgery represents a necessary health intervention and an integral part of the aging process. Despite all of the stigmas attached to surgery, it is actually quite an affordable medical intervention both for patients and for providers. As Cuba and Guatemala elucidate, there in fact already exists much of the necessary framework for expansion in poor and rich settings alike. As a result, cataract surgery should be integrated into our primary care framework and made available to individuals who cannot pay for it themselves. This movement is in the interest not only of the individual, and the wealth of meaning we invest in our site, but also for the state and for the international community who do not stand to benefit from an increase in preventable blindness.

VII. Conclusion

Table 4. Comparison of demographic data for Spain, Cuba, and Guatemala related to the growth of the elderly sector.

	Spain	Cuba	Guatemala
Percent of population over 50 (2012)	42.6	29	12.3
Percent of Population over 50 by 2025 (%)	35.3	41.5	14.5
Life expectancy at birth (2012)	82	78	71
Growth Rate (2012)	0.7	-0.1	1.9
Total fertility rate (2012)	1.5	1.5	3.2
Net migration rate ⁰ (2012) (per 1,000 population)	5	-4	-29
Cataract surgery rate (per million) ³⁴	12000 ³⁵	3125 ³⁶	895 ³⁷

Based on the findings of this study, including data regarding the senior demographic listed in the table above, we make the following conclusions and recommend the following policy changes for cataract surgery:

1. Cataract surgery needs to be expanded in all three countries because the senior demographic is growing and will continue to grow at unprecedented and increasingly large rates.
2. Although all countries need to expand cataract surgery, each one should make different advances in cataract surgery based on its unique requirements and assets.
3. Spain should continue to invest in Guatemalan and Cuban healthcare by supporting projects like *Operación Milagro* and by exporting healthcare in exchange for resources in a manner similar to Cuba. It should also encourage its citizens to receive cataract surgery in Guatemala and Cuba as a way to relieve the surgical backlog domestically and as a

³⁴ Cataract surgery rate is within the last 6 years depending on the data available.

³⁵ Sánchez-Ramos Roda, 2011

³⁶ Limburg, Silva, and Foster, 2009

³⁷ Limburg, Silva, and Foster, 2009

way to develop economic relationships which have been historically lucrative. However, it should develop its relationship with Guatemala much the same way Cuba has, by collaborating with local structures and medical practices.

4. Cuba should continue to develop the *Salud y Turismo* industry as a way to generate the revenue necessary for universal primary care and cataract surgery domestically. However, Cuba should make privatized medical services more available to its population. It should make the dollar-peso exchange rate equal for Cubans and for foreigners and it should allow Cubans who can afford privatized medical services, such as a cataract surgery, to pay for those services regardless of their nationality.
5. Despite stigmas attached to surgery, Guatemala has sufficient resources, such as surgical centers and ophthalmologists, to provide cataract surgery to the entire country. In order to harness these resources and address issues of underutilization, Guatemala should deconstruct the barriers between Mayan medicine and biomedicine. These barriers can be dismantled by continuing to educate practitioners in both medical models and by encouraging biomedical providers to collaborate with, rather than supplant, ethnomedical structures.
6. All three countries should continue to practice and expand the medical exchange already in place. Increased international collaboration is a promising strategy for expanding cataract-surgical coverage.

Interdisciplinary conversation

All of the conclusions regarding health, national forces at work, and international dynamics above, have been made possible by an analysis of cataract surgery. Through cataract surgery we were able to argue that Guatemala should incorporate Mayan medicine into its healthcare framework that, Cuba should deconstruct healthcare segregation, that Spain should continue to invest in Latin America and that the aging of the population represents a global concern. This shows not only the correlation between interventions and society, but it gives concrete substantiation of larger societal trends. Although it may be valuable to note that Cuba has a two-tiered medical economy, or that the senior demographic is growing, these broad arguments are made meaningful by the tangible example of cataract surgery. The reality of

cataract surgery- who accesses it, how they access it, and why they access it- gives a tangible illustration of these larger phenomenons. In this way, cataract surgery substantiates broader global health claims. The use of a specific medical intervention to talk about societal dilemmas provides a deductive platform for cultural, economic, and social discussion.

The reverse inductive relationship is equally as valuable. For those discussions which are focused exclusively on cataract surgery itself, invoking broader dynamics is useful for strategizing expansion and improvement. Recalling the expressed need for consideration of cultural, economic, and historic dynamics related to cataract surgery, societal climate needs to be recognized in order to expand cataract surgery. The numerous studies which have documented problems in “uptake” and patients, who can afford to operate but choose not to, especially in developing countries, point to the need for interdisciplinary discussion. Across the world, cataract surgery can be fairly easily and inexpensively integrated into primary care. However, such an expansion necessitates dialogue about all the different forces at play in cataract surgery and a consideration of what is at stake for the individual.

Vision

Finally, in the case of cataract surgery the need for holistic conversation is particularly clear due to the intimate relationship the individual maintains with her ability to see. The graphs of demographers, the data of researchers, the narratives of ophthalmologists, the stories of patients, the ethnographies of anthropologists, can all help explain why preventing blindness is a meaningful endeavor. Although the combination of these discourses provides a stronger, collective perspective, they are ultimately only an approximation of what is truly at stake for the individual. Vision is so integral to the human experience that it cannot be overstated or even fully explained. The fact that we cannot conclusively quantify or qualify the value of vision, speaks to why it is worth fighting for. Fundamentally vision is so significant that it escapes definition; perhaps because it is axiomatic to our reality -“I shut my eyes and all the world drops dead; I lift my eyes and all is born again” (Sylvia Plath)

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Annex #1: Demographic and health-related data

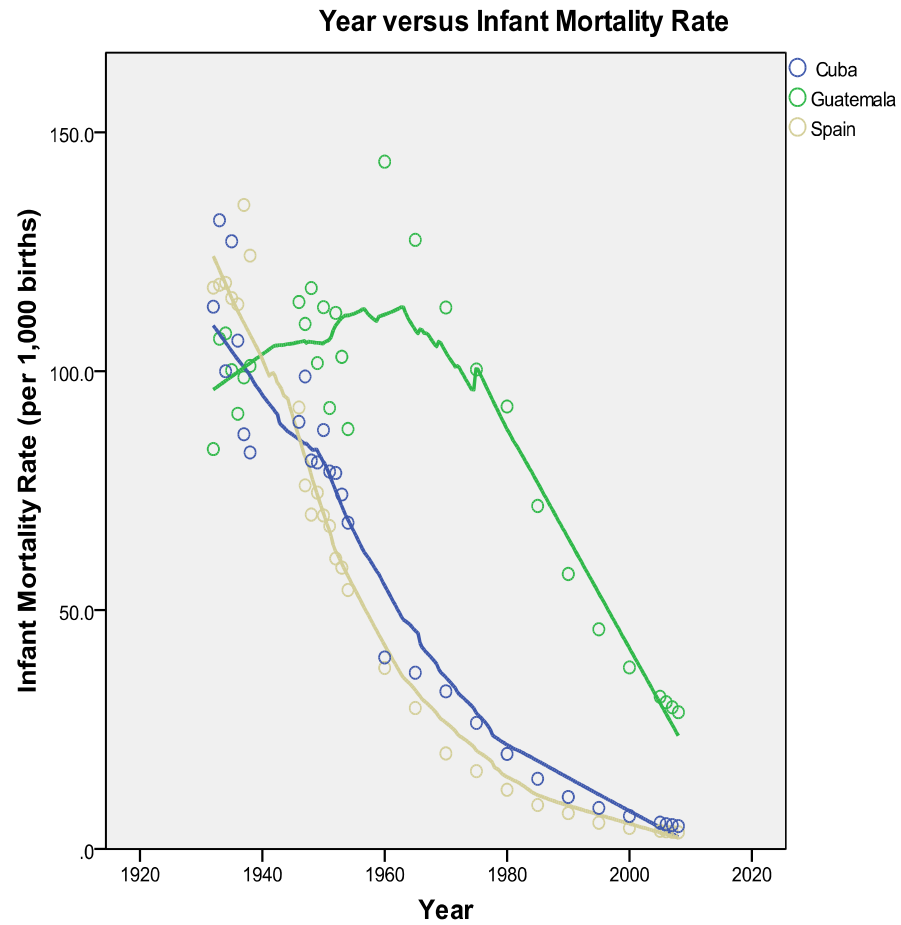


Figure 1. Infant Mortality Rates for Cuba, Spain, and Guatemala according to year. Sources: U.N. Demographic Yearbook 1957/1961, World Development Indicators 2008

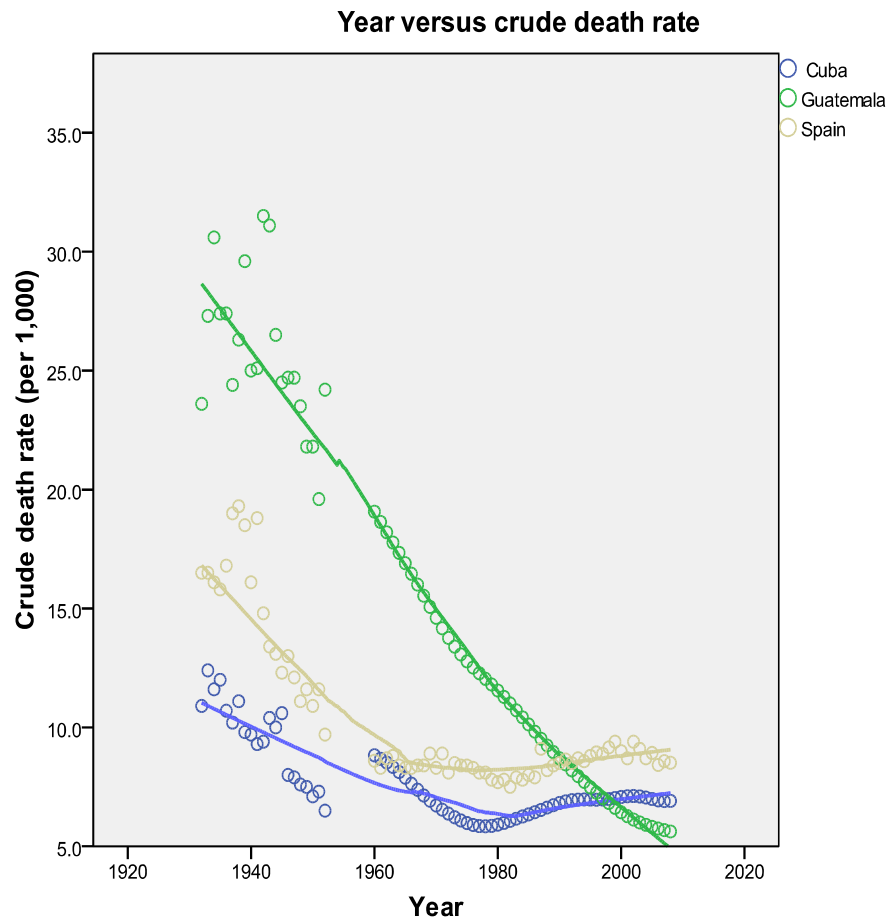


Figure 2. Crude Death Rates for Cuba, Spain, and Guatemala according to year. Sources: U.N. Demographic Yearbook 1957/1961, World Development Indicators 2008

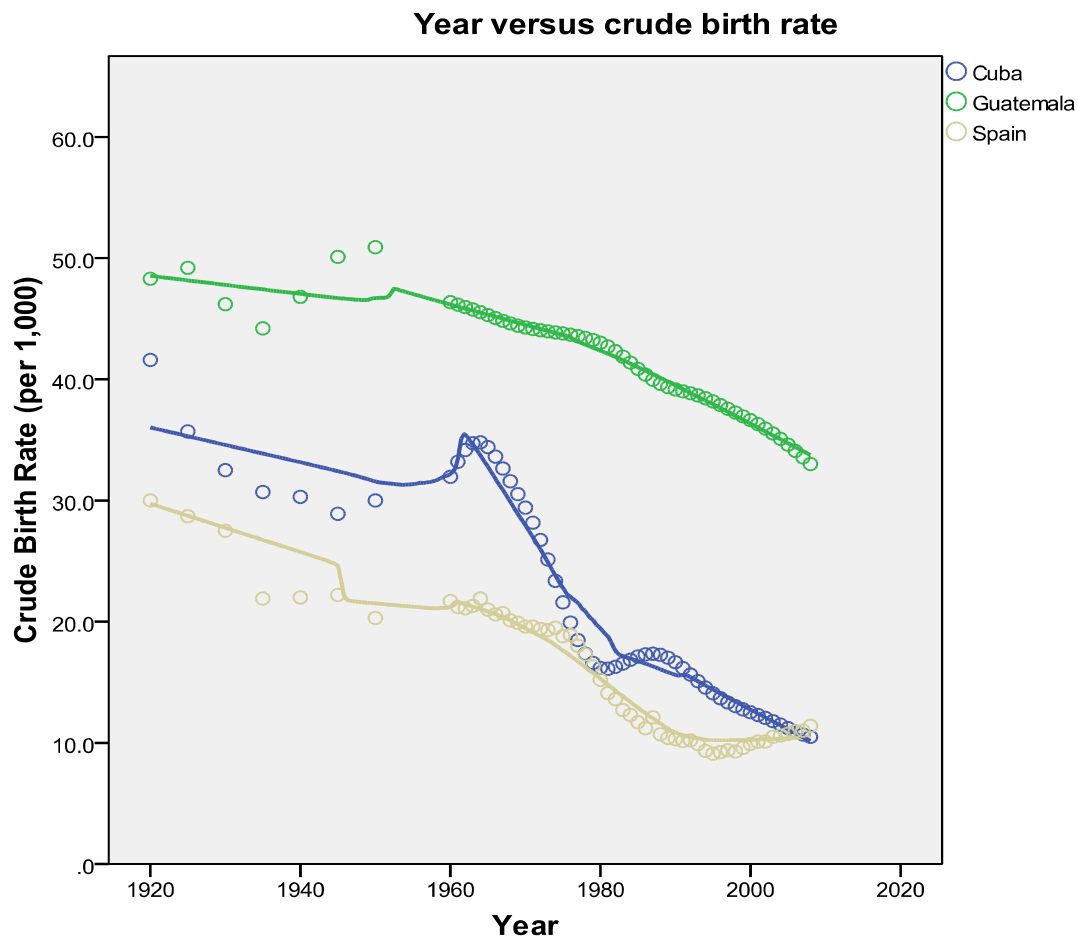


Figure 3. Crude Birth Rates for Cuba, Spain, and Guatemala according to year. Sources: U.N. Demographic Yearbook 1957/1961, World Development Indicators 2008

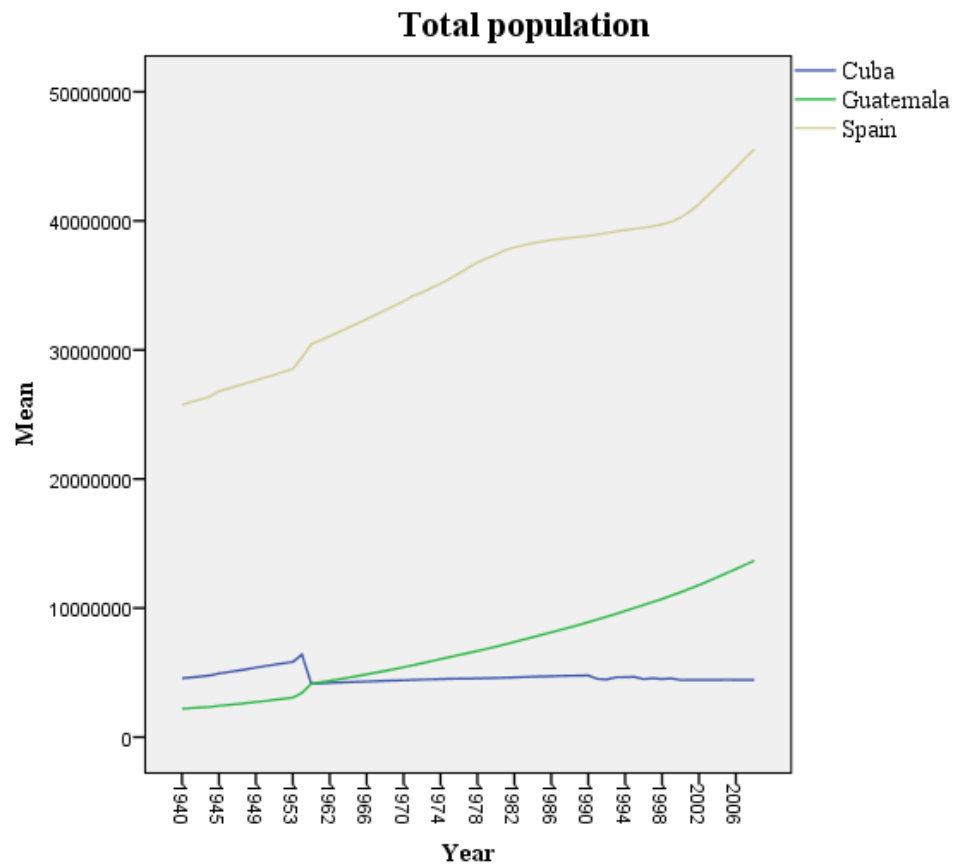


Figure 4. Total Population for Cuba, Spain, and Guatemala according to year. Sources: U.N. Demographic Yearbook 1957/1961, World Development Indicators 2008

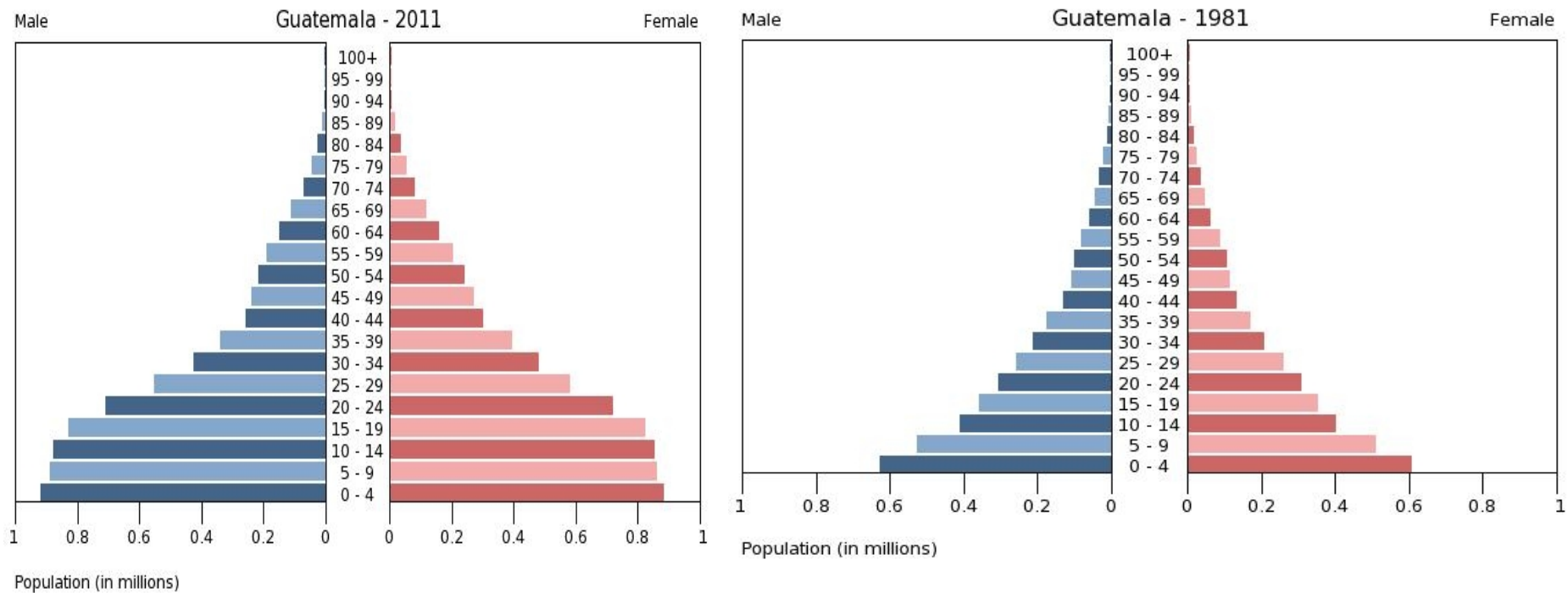


Figure 5. Population pyramids for Guatemala in 2011 and 1981 (earliest available population pyramid). Male population is displayed on the left, female population is displayed on the right. Source: U.S. Census Bureau

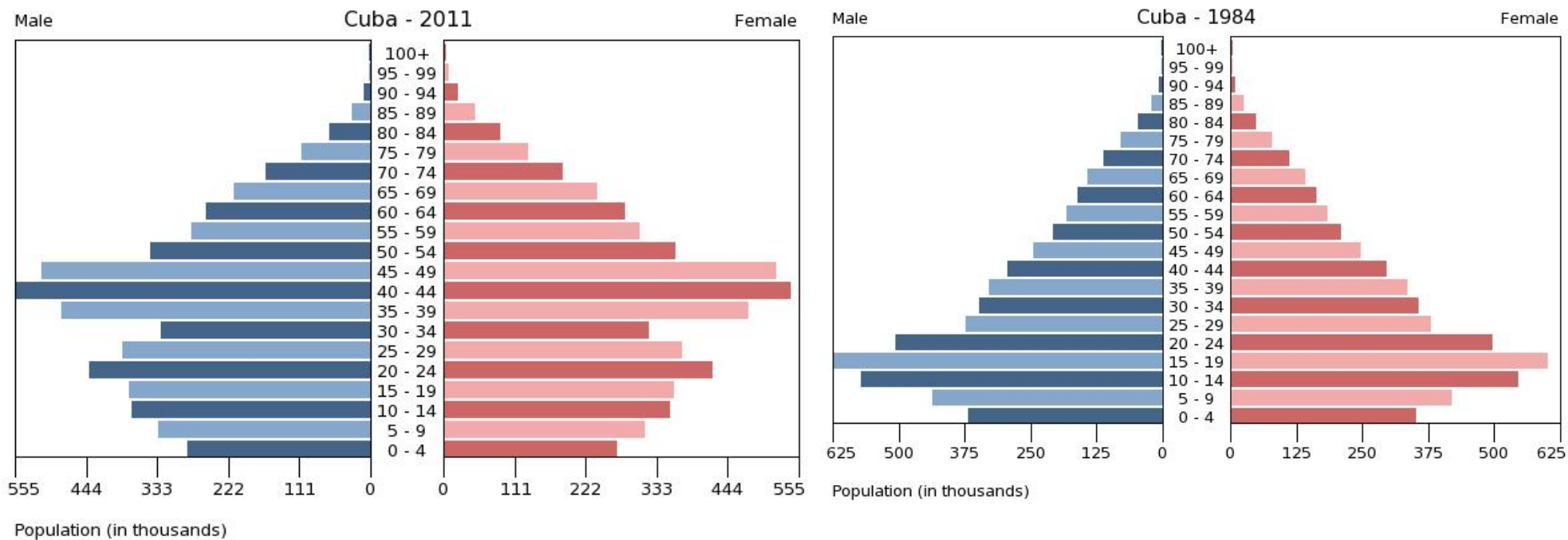


Figure 6. Population pyramids for Cuba in 2011 and 1984 (earliest available population pyramid). Male population is displayed on the left, female population is displayed on the right. Source: U.S. Census Bureau

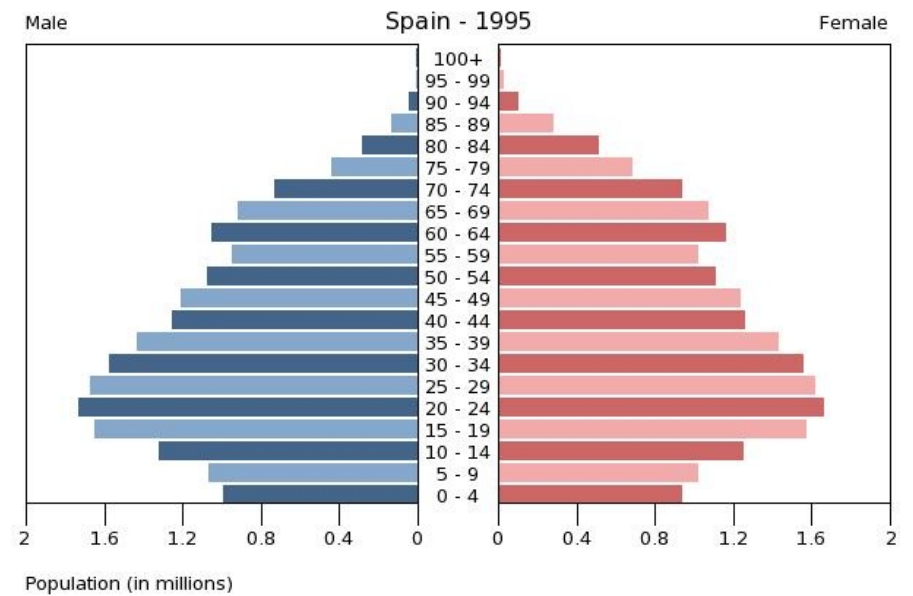
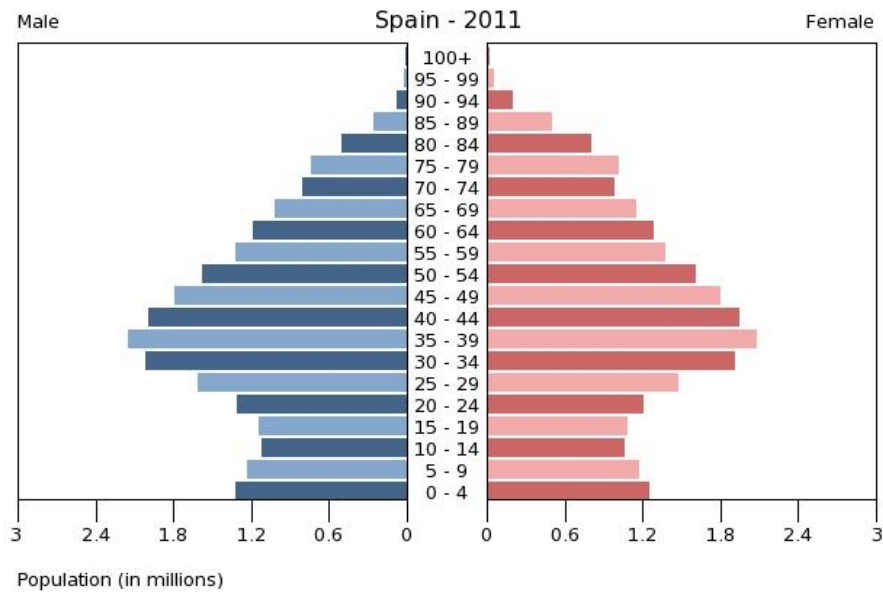


Figure 7. Population pyramids for Guatemala in 2011 and 1981 (earliest available population pyramid). Male population is displayed on the left, female population is displayed on the right. Source: U.S. Census Bureau

Year versus health expenditure as a percent of total GDP

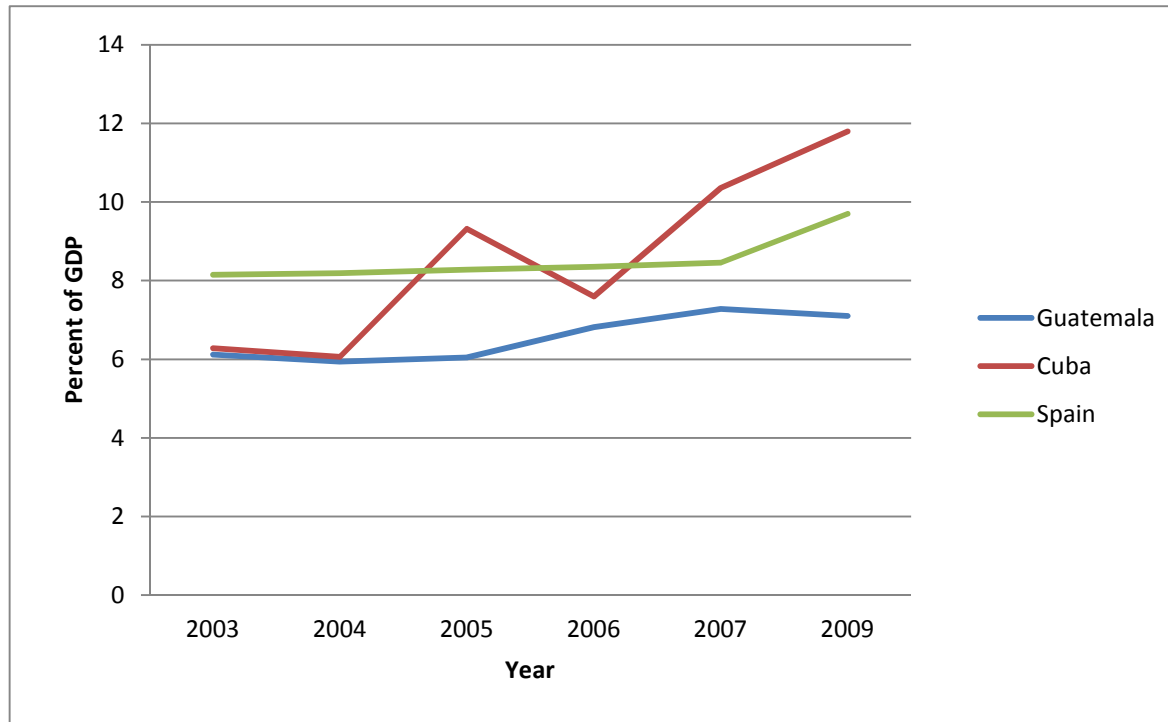


Figure 8. Year versus health expenditures as a percentage of total GDP. Source: World Development Indicators 2008, WHO, 2011.

Year versus Life Expectancy

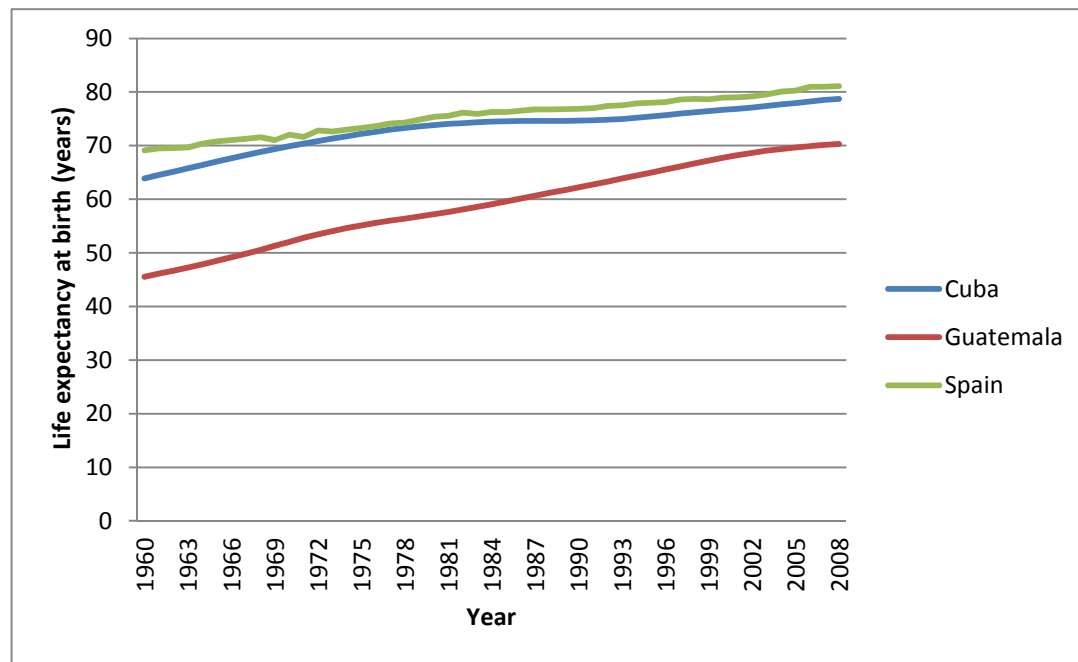


Figure 9. Year versus life expectancy. Source: World Development Indicators 2008.

Year versus rural population percentage

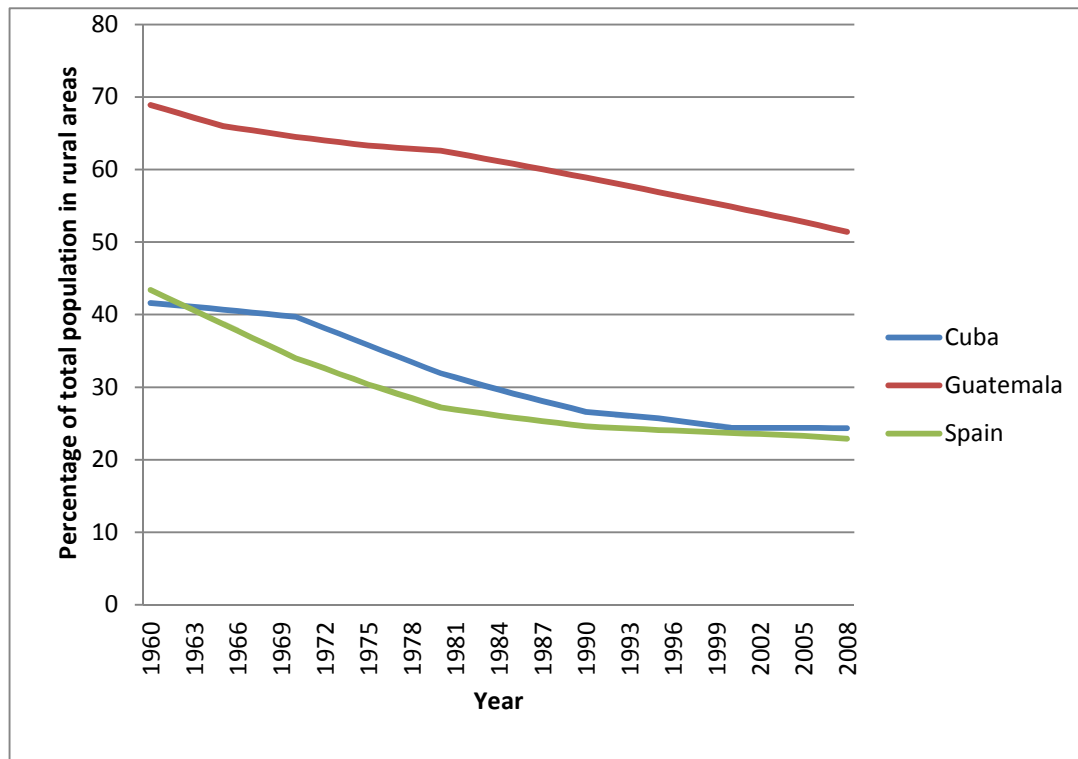


Figure 10. Year versus rural population percentage. Source: World Development Indicators 2008

Annex #2: Detailed description of cataracts

DESCRIPTION OF SENILE CATARACT¹

CATARACT kat'ah-rakt

opacity of the lens of the eye or its capsule.

CAUSES AND SYMPTOMS: Some cataracts result from injuries to the eye, exposure to great heat or radiation, or inherited factors. The great majority, however, are “senile” cataracts, which are apparently a part of the aging process of the human body.

Blurred and dimmed vision are often the first symptoms. The patient may find that a brighter reading light is needed, or objects must be held closer to the eyes for better vision. Continued clouding of the lens may cause double vision; eventually there may be a need for frequent changes of eyeglasses. These symptoms do not necessarily indicate cataract, but if any of them are present, an ophthalmologist should be consulted immediately.

TREATMENT: The only known effective treatment for cataract is surgical removal of the lens (lens extraction or cataract extraction). The procedure of choice was formerly intracapsular extraction, with total removal of the lens within its capsule. This may be done by forceps or by cryoextraction using a supercooled metal probe that forms a bond with the lens capsule. The inner portion of the lens can be removed by emulsification and aspiration. More recently the removed cataract has been replaced with a plastic intraocular lens. In this procedure the inner portions of the lens (the nucleus and cortex) may be all that is removed; the capsule is retained and the intraocular lens is placed inside it.

The lens of the eye serves only to focus light rays upon the retina. After cataract extraction the loss of the natural lens is compensated for by either special eyeglasses or contact lenses. Implantation of a permanent artificial lens, either during cataract surgery or later, is an alternative to use of cataract spectacles and a removable contact lens.

PATIENT CARE: Eye drops are administered to produce mydriasis and vasoconstriction. Because these patients may have extremely poor eyesight, care should be taken that they do not injure themselves. Local anesthesia is usually preferred for the surgical procedure and preoperative medications are given to produce drowsiness. Ambulatory care surgery with same-day admission and discharge is becoming increasingly routine. Careful observation of the patient on follow-up visits is important. One needs to be on the alert for a complaint of pain in the eye followed by nausea and vomiting. These could be signs that the patient has increased intraocular pressure within the operative eye and measures need to be taken to reduce the pressure.

after-cataract any membrane of the pupillary area after extraction or absorption of the lens.

atopic cataract cataract occurring, most often in the second to third decade, in those with longstanding atopic dermatitis.

brown cataract (brunescent cataract) senile cataract appearing as a brown opacity.

¹ Miller-Keane Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health, Seventh Edition. © 2003

capsular cataract one consisting of an opacity of the capsule of the lens.

complicated cataract secondary cataract

cortical cataract an opacity in the cortex of the lens.

hypermature cataract one in which the entire lens capsule is wrinkled and the contents have become solid and shrunken, or soft and liquid.

immature cataract (incipient cataract) an incomplete cataract; the lens is only slightly opaque and the cortex clear.

intumescent cataract a mature cataract that progresses; the lens becomes swollen from the osmotic effect of degenerated lens protein, and this may lead to secondary angle closure (acute) glaucoma.

lenticular cataract opacity of the lens not affecting the capsule.

mature cataract a cataract that produces swelling and opacity of the entire lens; cataracts are removed before maturity.

presenile cataract a subcapsular senile cataract in a person under 40 years of age.

secondary cataract a cataract, usually posterior subcapsular, that arises from either disease, degeneration or surgery (such as glaucoma filtering or retinal reattachment).

senile cataract cataract with no obvious cause occurring in persons over 50 years old.