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THE BACKBONE OF LATIN AMERICA: RECENT DEVELOPMENTS AND NEW DIRECTIONS IN ANTHROPOMETRIC HISTORY

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Abstract

This article examines scholarship in the anthropometric history of Latin America, published after the last survey in 2016. The field has grown in diverse senses: there are studies for countries that had not been studied before, such as Bolivia, Peru, Puerto Rico, and Trinidad, and the scholarship covers broader periods and in more detail for those countries that were first studied such as Argentina, Colombia, Mexico and especially Chile. New methodologies are used to examine height data and its determinants beyond the traditional realm of anthropometric history, such as gender dimorphism, nutrition, and Technophysio evolution. The approach has also led to assessing the effects of immigration and violence on living standards. This growing scholarship contributes to deepening our understanding of the region's socioeconomic aspects of stature, inequality, and welfare. More historical analysis would help to further our knowledge of the context in which these processes evolved in different periods for different countries. The field can expand and be part of debates on these topics beyond Latin America in many ways.

Keywords: Health, Living Standards, Stature, Inequality
JEL Classification: I12; I31; N36

Resumen

Este artículo examina los estudios sobre la historia antropométrica de América Latina, publicados después de la última revisión historiográfica en 2016. El campo ha crecido en diversos sentidos: hay estudios para países que no habían sido estudiados antes, como Bolivia, Perú, Puerto Rico y Trinidad, y la literatura cubre períodos más amplios y con más detalle para aquellos países donde empezó el campo, como Argentina, Colombia, México y especialmente Chile. Se utilizan nuevas metodologías para examinar los datos de altura y sus determinantes más allá del ámbito tradicional de la historia antropométrica, como el dimorfismo de género, la nutrición y la evolución "Technophysio." El enfoque también ha llevado a evaluar los efectos de la inmigración y la violencia en los niveles de vida. Este creciente número de trabajos contribuye a profundizar nuestra comprensión de los determinantes socioeconómicos de la estatura, la desigualdad y los niveles de bienestar de la región. Ahondar en el análisis del contexto histórico en que se dieron estos procesos ayudaría a profundizar nuestro entendimiento del cómo y porqué evolucionaron estos elementos en diferentes períodos para los diferentes países de la región. El campo puede expandirse y ser parte de debates sobre estos temas más allá de América Latina.

Palabras clave: Salud, Niveles de vida, Estatura, Desigualdad
JEL Classification: I12; I31; N36

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1. Introduction

Since 2016, when the last survey on the scholarship in the field of anthropometric history in Latin America was published, there has been a growth in new studies (López-Alonso, 2016). Publications have increased in diverse senses: there are studies for countries that had not been studied before, new methodologies to examine height data and its determinants and thus biological standards of living, and scholarship covers broader periods. The evolution has not been homogeneous for all countries in the region, but the advances thus far are promising.

The study of living standards and inequality, in the long run, has sparked great interest from economic historians in the region and has produced special issues on the topic in specialized journals or that included some articles on the subject (Martínez-Carrión & Salvatore eds., 2019 in RHE-JILAEH, Martínez-Carrión, Salvatore & Varea eds.,2021 in IJERPH; Arroyo Abad & Zegarra, ed. 2023 in IEH-EHR). Biological anthropology and bioarchaeology have produced interesting scholarship that, although not explicitly presented as research in anthropometric history, does speak to the field in ways that could make substantial and innovative contributions.

This article aims to present an overview of the recent advances in the field since 2016 and discuss their validity in Latin American economic history, as well as the challenges and questions moving forward. To do so, the rest of this essay will be organized as follows: The next section will discuss the relevance of anthropometric history to Latin American historiography. The third section will provide a summary of the biological anthropology and bioarchaeology scholarship and then will do an overview of the works and findings on anthropometric history. The fourth section will present the new questions and challenges in the years to come. The fifth section will conclude.

2. Anthropometric History in Latin America for what?

The evolution of human stature and its determinants is a peculiar measure that encompasses the outcome and mysteries of humanity at large (Bogin, 2001). All humans have stature, which is relevant at the individual, familial, community, regional, national, and global levels. The anthropometric history of Latin America has produced scholarship around three overarching themes. First is the study of the evolution of living standards and economic conditions over the long run, dating back to the pre-Columbian era. Second, assess how changes in biological standards of living enhance our understanding of how they were affected by economic development compared to other regions. Third, the comprehension of interactions between health and nutrition indicators and economic performance among different groups in the contemporary period.

The findings of Latin America's anthropometric history have contributed to studying living standards, inequality, global poverty, and comparative development. Still, scholars in economics and economic history have not included biological welfare as one standard measure of living standards and inequality. Nonetheless, even those who have been openly critical of anthropometric measures, such as Timothy Leunig and Hans Joachim Voth, accept that "[h]

eight data will continue to be the future of economic historians, where they are one reliable data source (Leunig & Voth, 2004, p. 420)." This will include countries in which the data compilation is incomplete or unreliable. Historical Statistics in Latin America fall into this category, given that the informal economy historically and to this day is still so large. Leunig and Voth do not dismiss height data altogether, but they claim that its relevance will lose importance as populations reach their maximum potential height. There will be more accurate forms of measuring living standards. Still, they accept that weight variations will continue to be a significant measure as it is closely related to health and living standards. Height and weight are outputs of the improvement or lack of it, and as such, they measure the effectiveness of policies or any other change conducive to improving living standards. Inequality and informal economy are two salient features of many Latin American economies; hence, the pertinence of anthropometric history research as one valuable method to study standards of living that complement other traditional measures. Additionally, stature and weight are viable measures to assess the effects of changes in health and nutrition on living standards and inequality.

3. Current status of the scholarship in Anthropometric History of Latin America

Anthropometric history has grown substantially in depth and breadth since the last historiographical survey in 2016. Unlike other fields of history or economic history, scholars who become interested in anthropometric history do not tend to specialize in a specific period but rather in the question of the evolution of biological living standards and start where their first databases are available and then move forward depending on the data that becomes available. The data sources are not in traditional repositories; thus, finding them requires engaging in interdisciplinary collaborations and doing archival research in nontraditional repositories.

The fluidity of periods, search of data, and interdisciplinary collaboration germane to anthropometric history research make it worth discussing the scholarship produced by biological anthropologists and bioarchaeologists as their findings inform the evolution of living standards in the long run, pre-1492 and post-1492 periods and following populations until the contemporary period. The first subsection will delve into this topic, and the second section will examine the scholarship in anthropometric research of the post-eighteenth-century period by country.

Biological Anthropology and Bioarchaeology of Latin America

Biological anthropology and bioarchaeology are fields that produce scholarship relevant to studying economic history, especially anthropometric history, as Richard Steckel's works have shown (Steckel & Rose, 2002; Steckel et al., 2018). Scholarship in Latin America is vast, and its findings can facilitate our understanding of the evolution of societies in the long run. The different subdisciplines produce works useful for pre-Columbian and colonial times. Others are more relevant to more contemporaneous populations. A recent publication on biological anthropology in Latin America (Uberlaker & Colantonino, 2019) presented a synthesis of the state-of-the-art scholarship by region of Latin America around the different subdisci-

plines namely biodemography and epidemiology, bioarchaeology, and skeletal biology, paleopathology; forensic anthropology; population genetics, and growth, development, health, and nutrition. This collection guides the reader to the methodologies employed, which is valuable when incorporating information into anthropometric research. Some studies are more region-specific, such as the Mesoamerican Region (Tiesler ed. 2022).

The incorporation of the findings of this scholarship in the study of biological welfare is not intended to have information on the pre-Columbian era to find the roots of inequality in Latin America in pre-1492 societies in what is modern-day Latin America but rather recreate living conditions and living standards of past populations including biosocial factors. This is to acknowledge that the findings from the past can help understand the present. Research has shown that certain aspects of these past societies have shaped the health and disease of contemporary populations through multiple genetic studies, such as the study of blood groups and protein polymorphisms in native populations and abnormal hemoglobin in Human Leucocyte Antigens (HLA). These types of studies help trace admixture in different geographies and populations that were ethnically classified according to their historical origins. These studies have been helpful, among other things, in understanding why Amerindian populations did not have immunity to the different diseases brought by Europeans and Africans and in uncovering the different migration patterns. Recent archaeological findings, with the help of Light Detection and Ranging (LIDAR) techniques, uncover information about the Western Hemisphere populations in the pre-1492. These populations were more extensive and more complex than were thought. Findings in Chile, Bolivia, and Brazil debunk myths about the size of populations pre-1492. The motivation is not to compress the years between pre-1492 and the twenty-first century to understand poverty and inequality in the present day. The idea is to know insofar as technologies allow, the way their social and economic organizations worked and their biological standards of living. To be sure, these were not static societies, and there are many new research questions to explore.

For the study of more recent periods, it is important to acknowledge that physical anthropology departments in Latin American countries were founded as early as 1887 (Uberlaker and Colantonino, 2019, p. 356). With them, the measurements of human bodies in the region began. We will see later in this article that in Colombian scholarship, the systematic analysis of this data has yielded valuable results (Meisel-Roca & Granger, 2021). Furthermore, it was often physical anthropologists who conducted nutritional surveys and census, another important data source to ascertain biological welfare. Scholarship on population genetics, forensic anthropology, and growth, development, and nutrition are data sources valuable for an in-depth study of the biological standards of living of the twentieth century.

Anthropometric History in Latin America from the Colonial Period to the Present.

There are many ways to examine the evolution of Anthropometric History in Latin America from the colonial period to the present. Although most studies tend to be country-specific, there was one important article that surveyed the evolution of anthropometric history in the region for the post-1950 period (Challú & Silva Castañeda, 2016). This article presents the

evolution of the adult stature of women in 12 Latin American countries based on demographic health surveys compiled by national and international organizations. Although it is not a specific study of sexual dimorphism *per se*, it laid the ground for studies on the topic. The study posits that the stature of women born between 1950 and 1990 has "[b]ehaved as a human development indicator, showing a steady increase that compared favorably to other developing regions but not so much with recently developed countries." (Challú and Silva Castañeda, 2016, p.226). Another relevant finding was that the increase in stature was independent of the evolution of the economic performance of the country. This study was an invitation to delve into the determinants of biological welfare in each country in region.

There have been comparative studies of Latin American countries with other regions of the world outside of the Global South. Chilean scholars have also assessed the evolution of living standards with respect to countries in the Industrialized North (Rivera-Cantillano & Llorca-Jaña, 2021). This study compared three countries in the Andean Region, Chile, Peru, and Bolivia, and two Nordic countries, Sweden, and Norway, considering population, biological welfare, and human capital during the nineteenth and twentieth centuries. While the population is larger in the Andean countries, Nordic countries excel in the rest of the categories, and Chile does better than Bolivia or Peru. One important finding is that Nordic countries are more homogenous in these categories than Andean countries, which speaks to different faces of inequality in the Latin American region. Henceforth, to highlight the relevance of the current findings and how scholarship has evolved, I will examine the evolution of each country for which there is scholarship and discuss them in alphabetical order.

Argentina

Anthropometric studies on Argentina were the first to be conducted in the region. The scholarship has continued to grow for nearly three decades, primarily by or co-authored by Ricardo Salvatore. He has also co-edited the two latest journal issues on the topic (Martínez-Carrión & Salvatore, 2019; Martínez-Carrión, Varea & Salvatore 2021). Recent works have delved into the synergies between nutrition and biological living standards. One study examines net nutrition inequality in 1875–1950, a relevant period in Argentina's development and economic history. Findings show that economic development in different sectors of the economy had different effects on the biological well-being of the population. Export-led growth led to stable or declining net-nutrition inequality while import-substituting industrialization generated significant net nutrition inequality. Also, a relevant finding on inequality: the highest levels of inequality in net nutrition took place in the 1916–1950 period in large urban, industrialized areas (Salvatore, 2019).

Another study examines the evolution of stature of the population of Pampas, the food-rich region of Argentina, to assess the effects of malnutrition rates in the long run. This study incorporates databases Salvatore has constructed over decades of research. The findings show that there is a decline in malnutrition over time. International conditions such as the decrease in migration from Europe, the decline in food exports after WWI, and the increase in employment in rapidly growing urban areas due to industrialization and government spending

on health and sanitation all contributed to a decline in malnutrition for the Argentine population for 85 years.

Scholarship on Argentina has shown the path for the sources that can be used and the questions that can be formulated in countries in the region that share similar natural resource endowments, population structures, and political histories. Argentina is a country where the relative price of animal protein intake is low concerning other countries in the region, and it has lower population densities. Recent nutrition studies are a good reference point for other countries' studies to ascertain the effects of income and regional inequality when nutrition quantity and quality vary. It also shows the possibilities of human plasticity in prosperous conditions.

Another more region-specific study sheds light on the effects of maternal, social, and environmental factors on birth size in the early twenty-first century (Martínez et al., 2022). This study looks at birth size in the Jujuy province. High-altitude pregnancies, in conjunction with the health and age of expecting mothers, can lead to low gestational-age (LGA) infants. The health conditions of the expecting mothers are also closely correlated to educational and income status. These datasets are available for more recent periods and offer the possibility of delving more into regional studies and ascertaining the effects of health and nutrition conditions in early life stages. It also builds on studies that examine the connections between altitude and health outcomes.

Bolivia

For Bolivia, the most recent study looks at the evolution of men's height in La Paz, the country's capital for cohorts born between 1880 and 1920. The study finds differences in stature across social classes, and during this period, average statures stagnate for all social groups. The authors attribute this result to "scarce improvements in agricultural production, increasing wage inequalities and, the persistence of a bad disease environment (Branisa et al., 2020). This result contributes to the understanding of socioeconomic determinants of stature.

Brazil

For Brazil, the extant research examines the evolution of male stature for cohorts born between 1850 and 1950 by looking at military and passport records. The data has national coverage. The findings show different trajectories in the evolution of biological standards of living across regions and social classes. Men from the North and Northeast were shorter than their southern counterparts. Passport holders were taller than soldiers. There is a general increase in stature of 2.5 centimeters for soldiers born between 1880 and those born in 1910. The study further explains that the increase is due to increasing incomes and public health interventions. Heights in the North and Northeast stagnated until 1910 due to disease environment as malaria and hookworm were rampant (Franken, 2019).

Chile

Chile is the country for which the research agenda has advanced more abundantly since 2016. One scholar has spearheaded this initiative: Manuel Llorca-Jaña. Although he has not authored all the articles on the topic, his works are in conversation with those few works he has not authored. This *tour de force* results from collaborative works with other economic historians and colleagues in other fields in his country and following the path regarding sources and questions used in other countries. This is one clear example of building scholarship around the study of living standards, venturing into the questions that can be formulated with the different data sources, and having a good grasp of the data sources in his country in all areas where data can be found and partnering with scholars who would bring their expertise to conduct the research most completely.

Since 2017, the first works examined the evolution of soldiers in the eighteenth and nineteenth centuries using miliary records (Llorca-Jaña et al., 2018) in which the findings show that Chileans were among the tallest population in the region during the eighteenth century. Eventually, there was a decline due to the fall in real wages and an increase in food prices. For the nineteenth century, there is another study using military records; for this period, there was a decline and then stagnation of average male statures. The argument presented is that the export boom of that period did not improve the biological living standards of the population (Llorca-Jaña et al., 2019).

Using prison records, research finds that in Chile, for those born between 1880 and 1930, also known as Nitrate Era, there was a penalty in height for those who were unskilled, illiterate, illegitimate, and indigenous (Llorca-Jaña et al., 2020). Moving to more long-term studies starting from the Nitrate Era to the 1990s, research delving into nutrition and living standards shows that there was a higher prevalence of stunting during the nitrate era, but then stunting decreased and biological living standards improved due to improvements in health, increase in caloric intake, decline in poverty rates and reduction in child labor (Llorca-Jaña et al., 2021a).

There are several studies on the topic of nutrition. A study that examines malnutrition among children during the same period shows that in the late nineteenth century, there was widespread stunting of children, especially among those who were poor. However, the increase in social spending helped children born in the 1940s and onwards escape malnutrition, highlighting the positive effects of public investment in health, sanitation, housing, nutrition, and public infrastructure (Núñez & Pérez, 2021).

A study focuses more on nutritional transition by looking at meat and milk consumption in the twentieth century. The article argues that Chile experienced a successful nutrition transition starting in the 1930s as the relative price of milk and meat declined, and given that Chileans have high-income elasticity, they increased their consumption, increasing their protein intake. The prices of milk and meat declined as partly the result of substantial economic changes such as Chile joining the international agribusiness revolution and having government support in social spending from the 1930s to the 1960s; there was increasing GDP per capita and macro-economic stability and trade liberalization (Llorca-Jaña et al., 2020b). Moving more to long-term studies for the twentieth century and following up on this successful nu-

trition transition, there is an estimation for male heights in the twentieth century; the finding is that there was a 5.5 cm increase in height primarily during the second half of the twentieth century (Llorca–Jaña et al., 2021b)

There is also a study on demographic transition in twentieth–century Chile. (Llorca–Jaña et al. 2021c) The sharp decline in adult and infant mortality started in the 1930s and continued until the 1990s. This result is consistent with the argument for improved biological standards of living made in other articles. Another positive factor is that mortality has decreased in all regions and has reached levels that are all comparable, meaning that there is not one region where there is higher mortality, suggesting that improvement in living standards has allowed for regions with higher mortality to converge with others.

Sexual dimorphism is another topic examined by Chilean anthropometric history. Two studies have studied the topic to assess gender differences in the evolution of living standards. One study covers part of the twentieth century in the two largest cities in Chile: Santiago and Valparaiso (Castellucci et al., 2021). The other covers the period 1860 to 1990 and the national levels (Llorca–Jaña et al., 2022a). Both studies find there has been an improvement in Chilean women's biological standards of living, especially for women who were adults in the second half of the twentieth century. While the gender gap has been closing, and this can be taken as a reflection of the overall improvement in welfare for women, there are persistent internal inequalities as heights have a positive correlation with literacy and occupational status and a negative correlation for those who are of indigenous descent.

A study assesses the Technophysio evolution in Chile using results from previous studies. The conclusion is that Chile has experienced a late and incomplete evolution. Biological living standards have improved, but labor productivity has not (Llorca–Jaña et al., 2022b). One last subject that Chilean scholarship has examined is that of violence. Although it does not utilize height information, it does study the correlation between violence and well–being. The study shows how more social spending and poverty reduction are conducive to less social violence (Rivero–Cantillano et al., 2021).

Colombia

Colombia has had multiple studies since the early 2000s, spearheaded by Adolfo Meisel, that have expanded knowledge on the biological well–being in Colombia. Since 2016, the scholarship has delved into regional convergence, gender dimorphism, and children's and adolescents' biological living standards. One salient feature of studies on Colombia is the availability of databases for the twentieth century gathered by government offices, which offer a comprehensive, national–level overview of stature and its determinants. An article examining socioeconomic determinants and spatial convergence of biological well–being confirms that it improved for men and women born between 1920 and 1990. For women, height increased by 4.1 cm and 5.8 cm for men, and there was a regional convergence of social indicators. (Meisel et al. 2019, p.330). The improvement results from sustained economic growth, better nutrition, health, education, and public services. Improved sanitation and drinking water provision helped reduce mortality from gastrointestinal, respiratory, and puerperal diseases.

Building from these results, another article explored the evolution of socioeconomic determinants of gender height to estimate Colombian living standards during the twentieth century. The article finds decreasing trends in gender inequality during the first half of the twentieth century and an increasing trend since the 1960s, supporting the eco-sensitivity hypothesis. Thus, gender dimorphism was higher among taller individuals (Meisel et al., 2023). Growing GDP, women's education, and labor participation helped reduce gender inequality during the first half of the twentieth century. For the second half of the twentieth century, men experienced a more significant benefit. During this period, demographic and epidemiological transition, improved nutrition, and declining infant mortality happened. Furthermore, confirming the hypothesis that gender dimorphism shortens during war periods in Colombia, this effect was observed during the *la Violencia* period due to its economic consequences. This finding builds upon another study that conducted a demographic analysis of *la Violencia* in Colombia (Romero-Prieto & Meisel-Roca, 2019).

Another article reviewed anthropometric studies of Colombian children and adolescents between 1957 and 2020 (Meisel-Roca & Granger, 2021). This survey shows that these studies were rigorous in the methodology and had specific objectives. Earlier studies focused on differences among socioeconomic levels, while later studies were interested in minority groups such as indigenous people and Afro-descendants. The overall balance of this thorough review is that there was an improvement in anthropometric indicators over time, across territories, and in different socioeconomic groups. This finding is consistent with the rest of the scholarship on Colombia.

Mexico

Scholarship on the anthropometric history of Mexico dates to at least 2000 and has been amply covered in earlier compilations. The earlier studies by different authors have examined the period that covers the eighteenth to the twentieth century; hence, in general terms, the evolution of adult stature of the Mexican population has been estimated. For the eighteenth century, there still needs to be a consensus on whether the late colonial period improved or declined in living standards. In the study of the twentieth-century biological standards of living, works agree that there was a slow growth with persistent inequality (López-Alonso, 2016). More recently, studies have concentrated on the twentieth century or the nineteenth and twentieth centuries. A long-term survey looks at the evolution of stature as a mirror of poverty and inequality levels (López-Alonso, 2021). Focusing on the post-1950 period, another article studies the relevance of education as a determinant of biological welfare (López-Alonso & Vélez-Grajales, 2019). Another work also delves into how nutritional transition due to urbanization and changes in dietary habits contributed to the evolution of biological standards of living of the Mexican population during the second half of the twentieth century (López-Alonso, 2024). Mexico in the post-1950s period is a case in which the economy grew more than biological welfare indicators. Inequality in access to education, the high relative prices of animal protein, rapid urbanization, the ill effects of agribusiness, and the emergence of the ultra-processed foods industry canceled out the positive impact of government health

and nutrition programs of the post–1950 administrations.

Three studies look at self–selection in migration from three different experiences. Two studies examine the migration of Mexicans to the US. The first looks at the assimilation of Mexicans to the US compared to the migration of Italians into the US and ascertain the determinants that explain a better rate of assimilation of Italians vis–à–vis Mexicans (Escamilla–Guerrero et al., 2021). The second one examines the self–selection of Mexican migrants before and after the financial Panic of 1907 and how hiring practices in the US affected the stature of people who migrated to the United States (Escamilla–Guerrero & López–Alonso, 2023). The third study assesses the self–selection of Spaniards who migrated to Mexico after the Spanish Civil War to give a glimpse of the biological standard of living of migrants correlated to their regions of origin, human capital, and socio–economic status and how they did compared to their Mexican counterparts (Sánchez–Alonso & Caballero, 2023).

Peru

A recent first study on Peru sheds light on the secular trends of the heights of its adult population from 1895 to 2014 (Ruiz Zevallos, 2023). Based on the analyses of different data sources, this article examines the secular trend of heights of Peruvian men and women from different regions, social strata, and ethnicity. This work finds that, at the national level, there was a modest improvement in stature: 1.7 cm for men and 1.6 cm for women. The author presents the data in the historical context in which it was created in a way that makes it possible to formulate historical research questions. The article guides the reader, who is not a Peru specialist, through the economic history of Peru to understand the effects of urbanization, peasant struggle, and the effectiveness of health and education policies on biological standards of living. The author posits that in the Peruvian case, racism, centralization, and gender discrimination are essential determinants of stature.

Puerto Rico

Using census records and prison records, a study on Puerto Rico sheds light on the evolution of stature and living standards from the late eighteenth century to the annexation to the US. This study connects the political and economic history of the Island to anthropometric history and numeracy analysis. This work presents the case of a population's living standards depending on the price of one export commodity, sugar in this case. The study finds that the standard of living improved substantially in Puerto Rico between 1860 and 1880 thanks to the increase in the price of sugar and changes in the labor market. In contrast, after annexation by the United States, welfare declined following the pattern of the evolution of prices, given that its government was unable to improve social benefits for Puerto Ricans in the short term (Moreno–Lázaro, 2023).

Trinidad

A study on Trinidad looks at the effects of migration and selection bias and consistency in repeated measurement of adult heights. The works assess the laborers from India on departure to Trinidad and again several years later when opting to return to India to see if there were differences between men who stayed in India and those who departed before attaining full height. The caste subgroup analysis found similar results (Persaud, 2023). Although this study does not explicitly address a question relevant to the region's history, it does provide evidence of the living conditions of workers in the region.

4. Moving Forward: New Questions and Challenges

The current state of historiography has created a solid scaffolding to move forward with new questions and expand in emerging areas in the field, considering temporality, interdisciplinarity, and historical depth. There are three ways in which this progress could happen: topics, approaches, and answering the big questions. Let us elaborate on each.

Topics

Over two decades ago, Robert Fogel introduced the term Technophysio Evolution to argue that in the Western World, since the eighteenth century, changes in the human body's size, shape, and capability reflect and illuminate economic and demographic change over the past three centuries (Fogel 2004, Floud et al., 2011, Fogel 2012). Additionally, Angus Deaton's research on inequality built on these assumptions and added the argument that there were other elements, such as scientific advances in medicine and technological innovation, that translated into better public health infrastructure and improvement in the quality of diet that furthered the increase in longevity and health (Deaton, 2013).

Fogel and Deaton discussed how this evolution would happen outside the "Western World," where industrialization occurred later. However, technological innovation and scientific advances were adopted at similar times in the Western World. Both acknowledged that temporality and the evolution of *Technophysio* Evolution would vary from country to country. This is a very enticing topic in which anthropometric history is intertwined with the evolution of health and nutrition. More importantly, one topic that deserves investigation is the Latin American region. As mentioned in the previous section, one article examined *Technophysio* evolution in Chile (Llorca-Jaña et al., 2022).

The potential challenges that must be considered as researchers venture into studying *Technophysio* evolution in their respective countries are worth mentioning. Quality and quantity of data vary from country to country, especially when compared to countries of the "Industrialized North." Beyond the standard data bases on stature needed for anthropometric history, it is essential to have data on nutrition, dietary habits, and labor productivity. With labor productivity, it is essential to have a way to quantify the percentage of the labor force that is part of the informal economy and may not always be visible in official statistics.

Nutrition is one topic that is yet to be examined in more detail. Biological standards of living related to nutrition, evolution of dietary habits, and nutritional transition related to inequality are some of the questions that need to be formulated. Nutrition and its relevance in biological living standards have important long-term questions to respond to. It is a long-time connecting thread. Dietary habits can be inferred from the pre-Columbian era to the present; improvement in quantity and quality of diet is essential for assessing *Technophysio* evolution. The pernicious effects of changes in dietary habits due to the increase in the intake of ultra-processed foods that are high in sodium and sugar have led to overweight and obesity problems that have added to public health concerns.

Dietary habits, closely influenced by cultural and societal factors, can influence diet choices that may not seem "rational," still, they can explain why, despite knowing what we know about adequate nutrition, obesity has become a public health epidemic in Latin America. How this happens and how it is related to public policies of food security in every Latin American nation is something that needs to be investigated and will be better understood. Collaborative work can be done with physical anthropologists whose work encompasses a historical perspective. Additionally, examining the data produced by doctors, public health institutions, and nutrition surveys will be helpful. Nutritional surveys were conducted once Latin Americans became concerned with food security. Furthermore, the study of nutrition will link the study of height with that of weight, becoming a relevant indicator for more contemporary studies.

Some studies have begun to examine nutrition and dietary habits in some ways in Argentina (Salvatore, 2020), Chile (Llorca-Jaña et al., 2022), and Mexico (López-Alonso, 2024). Still, the topic deserves further research in general for all countries in the region. The best template to study this topic is the Spanish case. A recent publication shows nutrition as a relevant indicator of inequality when studied in the long run (Medina-Albaladejo et al., 2023). The questions posed in this work are worth exploring for Latin American countries. The findings on nutrition could also be paired with the already vast scholarship consumption baskets that exist for different countries in the region (Arroyo-Abad et al., 2012; Zegarra, 2021; Solares et al., 2023; Arias & Dentler, 2023, to name some).

Immigration and biological living standards are one topic where new studies are emerging. Stature can be used as one way to understand patterns of migration better or to assess the characteristics of migrants. This can be immigrants coming into Latin American countries, such as Spaniards, and how their departure implicated a loss in human capital for their home country (Sánchez-Alonso & Santiago-Caballero, 2023). Other studies examine how there could be self-selection patterns of Latin Americans who migrated to other parts of the world (Escamilla-Guerrero & López-Alonso, 2023) or to assess the process of assimilation to their new environment (Escamilla Guerrero et al., 2021). The study of migration patterns and the biosocial effects of those who migrated is also relevant among Bioarchaeologists. DNA analysis allows them to examine the gene flow and genetic drifts between indigenous populations during the pre-conquest period and afterward (Wesp, 2019).

Violence is another topic that is very much related to the features of human societies and one determinant that can affect the evolution of biological standards of living as it has repercussions on health and well-being. In pre-Conquest societies, it is one aspect that Bioar-

chaeologists examine (Ubelaker & Colantonio, 2019; Steckel et al., 2018). For Chile, there has been an examination of violence and its correlation with social spending over the past 130 years (Rivero et al., 2022). For Colombia, there has been a demographic analysis of *la Violencia* (Romero-Prieto & Meisel Roca, 2019). For the more contemporary period, these studies could be complemented with the findings of forensic anthropology.

Environment and living standards are another emerging topic. How did environmental changes affect living standards, and how do ecosystems shape human biology? Without falling into environmental determinism arguments, one question to examine is if environmental conditions matter more than lifestyle changes as a byproduct of urbanization and industrialization. This topic is peripherally related to the study of determinants of health in the long run. We know that climatic disasters influence health and can have long-lasting effects on the biological standards of living; it would be relevant to know if disaster prevention policies have helped mitigate the potential damage.

Approach

One way anthropometric history would grow is through studies with a long-term perspective of a century or more, including studies that cover the pre-Conquest period to the present. There is a value in having these to assess the evolution of health, well-being, and living standards, such as evaluating the relevance of the different determinants of living standards and inequality and how it has changed over time.

We need more in-depth studies at the national and regional levels to understand regional variation within countries and across nations. Local and regional studies give valuable insights into the diversity of nations that can easily be lost in national-level studies. Awareness of regional specificities is crucial in large countries and countries that are mega biodiverse and consequently have culturally diverse populations. It is essential to ascertain the determinants of its inequalities. National-level studies based on national-level data are also necessary.

We also need more interdisciplinary studies; these would be studies that go beyond the scope of economics and have a better grasp of demographic and socio-cultural diversity. For the pre-1492 period, the works of bioarcheologists/physical anthropologists were the way to approach it. Their findings tend to be published in more specialized journals, but collaborations are possible; *The Backbone of History* and *The Backbone of Europe* are excellent examples of these compilations (Steckel & Rose, 2002; Steckel et al., 2018).

For the post-1492 period, conversing with colleagues working in fields that study living standards with other data sources and methods, including medicine, nutritional science, physiology, auxology, and public health, is desirable. While their work is focused on the present and future, they are open and interested in historical perspectives. The other group is that of public policy and economic development economics researchers who are interested in studying living standards in the long run. It would also be positive and innovative if there could be collaborations with scholars working on living standards through different methodological approaches, such as prices and wages. There is a lot to be gained working together in shedding light on the causes of inequality from a historical perspective and contributing to the

work done by development economists. This collaboration would be about understanding why results in each field can be different.

Answering the Big Questions at the National and Regional Level

We need to construct a Latin American and national narrative on different topics, such as the evolution of biological standards of living, the Great Divergence, the evolution of inequality, and the history of health and its determinants. This would be an opportunity to argue where Latin America stood on the Great Divergence without being an anecdote in Global History scholarship.

Although there is a shared history of Colonialism, the inequality paths have been different for the different Latin American nations. Demographic, geographical location, natural resource endowment, and environment were significant determinants in these paths, along with socioeconomic, cultural, and political factors. Biological standards of living can shed light on this matter. Some publications mention the need for more studies on the anthropometric history of the Latin American region. However, there are still hypotheses to be made on how inequality evolved in the long term and its determinants. There are many commonalities among the different countries. Still, it is equally important to acknowledge the differences to see that it is a region that coheres well in many respects, yet it is far from homogeneous.

It is necessary to do this as an exercise of self-recognition. The pertinence of doing so is threefold: understanding national, regional, and global contexts. It establishes a consensus view on how the region did and why the analysis in global discussions will be elevated. In doing so, the Latin American region would not be reduced to be a comment in passing with a footnote relating to one local study or an isolated data point that international scholars can fish out of a random database devoid of context. It would also stop being put in the same group as decolonized nations that underwent colonization and decolonization in different centuries under different imperial forces. For nations decolonized in the twentieth century, the processes were different; therefore, the evolution of living standards may have been affected differently. Another question that could count as a new emerging question is comparative colonial effects.

Thinking of lessons from the past to better comprehend the present (the presentism that more traditional historians tend to hate but one reason to underscore the value of history) so that public policy lessons are tailored to the conditions of each nation and not a recipe of a policy that worked well in another distant nation that has a different context.

Challenges or Opportunities

More historical depth would help the field move forward in answering the big questions and reaching wider audiences. This means that with extant scholarship, there needs to be more historical analysis that goes beyond contextualizing results according to what is presented in the general history of each country under study. A compelling understanding of the long-term processes also requires a more profound knowledge of history. Results from anthropometric

history may have a different argument on living standards than those presented in official narratives; the debates and diatribes sparked around Fogel and Engerman's *Time on the Cross* may be the most notable case. Historical contextualization can prevent results that differ from being dismissed as being erroneous. Even if results do not challenge an "Official History," they may challenge the findings of other methodologies that assess living standards, such as prices, wages, and Gini coefficients, which can also cause dismissal. A thorough historical contextualization is the best way to strengthen a hypothesis and argument, and this can enrich the study of living standards and perhaps facilitate a conversation about how different approaches can yield different results and why, not make claims that one approach is better.

Publications in specialized journals are a solid and essential start for research agendas. Given the time and effort required to gather the data and acquire the knowledge to interpret results, it may be the best way to start a research agenda in anthropometric history. Many journals where most the anthropometric history scholarship is published do not leave room for in-depth historical interpretation because it is not their focus, but we need to move to the next step, which is to go beyond stating the findings from the use of refined and new methodologies to examine data with a brief interpretation of the results and their relevance in historical context. It is essential to add historical analysis to help debates advance.

There needs to be more and better databases on heights for all countries at the national and regional levels. This task has already been undertaken by colleagues with the creation of the Red Iberoamericana de Historia Antropométrica, which has the potential of being a repository of regional databases that is more detailed and abundant. There is much information on global databases, but the quality for Latin America appears uneven (https:Clio-infra.edu). Acknowledging that the quantity and quality of the historical height data for several Latin American countries will perhaps not match that of European countries, but also for this very reason, height data is relevant as it is a good measure to assess biological standards of living when the more traditional indicators have their deficiencies.

An overview of the extant state of the field shows that compiling national comprehensive databases appears to be more challenging as the size of population and territory increases; regional diversity can also add complexity. The cases of Mexico and Brazil are good examples of this. Political conditions and the intention of governments to produce statistics reflect on the quality and availability of data. For instance, nations with a stronger and better organized military in the twentieth century appear to have better military records for the twentieth century.

One last challenge is the need to make the results of this scholarship more accessible to wider audiences. This would include students at different levels, have more media presence, and make the research more accessible to policymakers and scholars outside of the field of economic history. Some development economists are incorporating anthropometric measures into their studies, but there is room for more collaboration. Regarding dissemination, the diffusion of our colleagues' works in Spain is an excellent example of how anthropometric research and scholarship can gain visibility with nonacademic audiences and be part of public discussions around living standards and inequality.

5. Conclusions

One thing is clear: knowing the evolution of biological living standards in all nations of Latin America would help understand the evolution of well-being, poverty, and inequality in the region. A review of the extant literature and its results shed light on the fact that inequality levels are far from homogeneous in the region. Countries are not unequal in the same way, and yet, for at least a century, policies designed to improve well-being and reduce inequality have been similar. International organizations have tried to apply the same formulas in the regions. It is possible to draw comparisons across countries to assess how environmental, epidemiological, nutritional, and demographic transitions were experienced in every nation. Still, it is crucial to incorporate a historical analysis; this requires delving into each nation's social, political, cultural, environmental, and economic history to understand better the determinants of the evolution of biological living standards. The topic is relevant. It is a vibrant field with many questions and research topics to be studied.

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