Aging Involves Everyone: Why we need more diversity in biogerontology

With technology ever advancing, we can limit the negative effects of aging and increase how long we live. Longevity research is an important piece of healthcare, particularly for the elderly, but they should not be the only ones focused on it. During a recent roundtable discussion with several field experts, it was revealed that there is difficulty in getting young people interested in the science of getting older (Comito). With longevity research being heavily funded and researched predominately by an exclusive group, it is important for young people from more diverse backgrounds to be in the field of biogerontology.

Biogerontology is the study of the biological processes of aging. This is different from gerontology, which is the study the general aging process, and from geriatrics which focuses on the care of elderly people. Biogerontology seeks to increase longevity and healthspan.[[1]](#footnote-1)

Longevity is a term meaning long life. Many people think of longevity as average life span. Average life span for citizens is documented in many parts of the world. The most common way to calculate it is lifespan from birth which is the average of how old someone lives from the moment of birth to the moment of death. One of the problems with this type of equation is that infant mortality plays a disproportionate role in the calculation. In England and Wales, 1901, one out of every seven infants died before the age of one (Infant & Child Health). At the same time, the average lifespan was 46.9 years (Roser et al.). This does not mean that most people lived to be 47, it means that the average lifespan including those who did not make it through infancy was 46.9 years.

Average lifespan has been improving for centuries (Roser et al). The biggest jumps have occurred during the last few. In the mid 1800’s hygiene began to take center stage when the city of Boston put out an announcement to encourage personal hygiene due to the outbreaks of Cholera (Quincy). Meanwhile, Joseph Lister created a publication titled “On the Antiseptic Principle in the practice of surgery” which significantly decreased the amount of deaths during surgical procedures (Lister). A third jump in average lifespan was due to the discovery of antibiotics in 1928 by Alexander Fleming and the later success of sulfa drugs (Gaynes). These technologies lowered how many people would die from infections.

One remarkable thing about average lifespan is the differences between populations. For example, in 2014 people in Japan have a life expectancy of 83.7 whereas people in South Africa have an average life span of 62 years (Roser). While there are many theories to explain the mentioned statistic, one common conclusion among gerontology scientists is that “health inequalities are very much linked to wealth inequalities” (Comito). This is no shock and the wealth disparities grow ever larger (Jutta Bolt).[[2]](#footnote-2)

There are different ways to go about looking at the science of aging. One is immortality, which is fraught with problems and poisons.[[3]](#footnote-3) It does have some standing in the greater scientific community, but only in conjunction with something known as the “longevity escape velocity” which was coined by David Gobel, the CEO of the Methuselah Foundation (Gobel). This is the idea that we can add years onto the average lifespan faster than we can die from aging.

The second school of thought is transhumanism. This tends to focus on enhancing and augmenting humans with leaps in technology. Transhumanism is greatly benefited by research and development in engineering, artificial intelligence, and prosthesis. The New Yorker lightly calls those focused on the tech/AI approach, the “Robocops” (Friend).[[4]](#footnote-4) One big name in transhumanism is Raymond Kurzweil. Raymond works as the director of engineering at Google and is optimistic for a biotech revolution.

The last school is the healthspanners. Healthspan is your healthy life span. It is the time you spend in life without any chronic diseases or aging related disabilities (Kaeberlein). This is the primary focus in the field of biogerontology. In the words of Ashley Montagu, anthropologist and humanist: “The idea is to die young as late as possible” (Thurman).

The first question that should be answered is why is biogerontology an important field. Since biogerontology is the study of aging and age-related diseases, the field is a matter of life or death.

To really understand why this research is so important, we can look at the top causes of death in the world. The top ten global causes of death in 2016 were chronic obstructive pulmonary disease; road injury; diarrheal diseases; tuberculosis; ischemic heart disease; stroke; lower respiratory infections; Alzheimer’s disease and dementias; trachea, bronchus, and lung cancers; and diabetes mellitus (WHO). From these ten, the last six are related to aging. Of those, heart disease accounted for one third of all deaths in people 65 years of age or older.

Age-related diseases are ones that occur more often as you get older, usually due to your cells senescing (Jaul et al). This means that research into senescence – a part of aging research – could help treat these diseases. Senescent cells are ones who have stopped dividing and usually destroy themselves. [[5]](#footnote-5) Sometimes they fail to destroy themselves and keep releasing inflammation and hormones. These can cause mutations, which can lead to cancer. This gets worse as you age and is why cancers are one of the leading causes of death in the elderly. (Campisi).

Death may not discriminate, but there is a difference in which diseases cause the most deaths per group. For example, the top five deaths for white people in the US who are 65 years of age and older are heart disease, cancer, stroke, chronic lower respiratory diseases, and Alzheimer’s disease: in that order. However, the 4th highest cause of death for Pacific Islanders, Hispanic, and Black Americans is diabetes, which is not even on the list for white Americans. It is also the 3rd highest cause of death for Asian or American Indians in the States. There are differences in percentages as well. Black Americans die by stroke 8.3% of all elderly deaths, but white Americans die at a rate of 7.8% from it (Gorina et al).

It is important for people from different races and ethnicities to be a part of biogerontology for this reason. People in medical sciences tend to focus on aspects of the science that hit closest to home. If people from different backgrounds come together, they can make sure that the focuses help a wider range of people. Since there are so many differences in health issues between races,[[6]](#footnote-6) this diversity is necessary.

Racial diversity in science is generally lacking. Dr. Michelle McMurry-Heath, the CEO of I Am Biotech hosted an event to discuss race and the role it plays in biotechnology. “Over one year while working in a biotech company, I never met anybody who was black” said Jeremy Levin, CEO of Ovid Therapeutics (Bio Digital).

More people from different races and ethnicities also might help with fair distribution among communities. People share information with those close to them and it spreads through localities. As information spreads so does awareness. Further, humans are social creatures. They care about the groups they belong to and will help defend against those in the status quo who may advocate for exclusivity.

Organizations can send recruiters to historically black colleges, or colleges that are in areas with prominent levels of minorities in order to increase their racial diversity. They should give their recruiters, as well as their current employees, some diversity training to create a more inclusive environment. This will aid in the comfort of both current and new employees, which increases retention.

When there are studies, companies should post them in diverse areas, which would also help make sure that the data is more representative of a random sampling. There are disparities in research, one example being cancer trials (Murthy). If you only have a single type of group in your clinical trials, you are not testing it for all humans. You are testing it for that specific group. Tony Coles of Cerevel asks “How do we think about addressing these issues of disparity in clinical trials (Bio Digital)?”

An argument against working towards a more diverse workplace is some people think that science is a true meritocracy[[7]](#footnote-7). They believe that the cream of the crop will rise to the top, regardless of any ‘outside’ politics. However, if this were the case, we would see a higher percentage of minorities in STEM.

Systematic discrimination prevents diversity. Even if the organizations themselves will welcome people from different backgrounds, it can be harder for minorities to obtain degrees and necessary experience, as well as funding to potentially relocate (Weller).

But fair distribution is not just an issue for communities based on race alone. It seems that the search for a longer life, and even immortality, has been a rich one. One great example is Qin Shi Huang (Changsha). Qin was the Qin Dynasty’s first emperor in China. He unified China and worked to build the great wall, but he also made it the government’s duty to search for something that would grant immortal life; Even with this structure across communities searching for the solution for everlasting life, it was never found. Qin eventually died from mercury poisoning, which was presented to him as a potential elixir of immortality.

One would think that using suspicious fluids without proper scientific research would be a thing of the past, however that is not the case. On February 19th, 2019, the FDA made an announcement regarding unproven plasma treatments (Gottlieb M.D.).

Several companies had begun selling treatments of young plasma to older customers to help fight against aging related issues including Alzheimer’s and heart disease. The concept is called parabiosis. A company named Ambrosia is selling a single liter of young donor plasma for $5,500 as of June 9, 2020 (Ambrosia).[[8]](#footnote-8)

People eager to capitalize on longevity may sell things that do not work. A wider range of people involved in the field may aid in lessening the amount of bogus treatments that get marketed.

Since some longevity research is in the private sector treatment pricing will vary by company or location. It is important for people from lower economic means to be a part of the scientific conversation to have a say in the pricing of these technologies.

Pricing is usually set for one of four reasons. The first is scarcity. The cost of a scarce item is hard to change, like in organ transplants. Next is because it is difficult or high-tech such as kidney replacements. Home dialysis machines used to be very uncommon, but their use has been growing and it has resulted in less costs (Harper). The third thing that helps set cost is the production cost. This is one reason having people from different economic means is important. To aid in accessibility, people might drive focus on making the treatment more cost effective. They could use different materials, find different suppliers, or generate better manufacturing processes. Regardless of how the price may be lowered, having people that are price conscious will steer the conversation down that pathway, rather than towards newer innovations.

An argument against this is that some people may find newer innovations to be more important than the cost of the item itself (Herzlinger). A good look at this is in technology. Certain brands focus on innovating and re-designing, while the cost of these new items increase. For example, the iPhone 11 Pro Max costs $1,099 (Apple). It is the current top phone for Apple. However, at launch, the iPhone 7 Plus costed $769 (McCann). This price difference is largely due to innovations and new technologies that inch higher each year.

An iPhone, though, is not a necessity. It is less important for a person to have a new iPhone, but it is especially important for everyone to have equal access to healthcare. This is why making a treatment cost effective would be a good step before going towards that next improvement.

The last thing that influences price is choice. Some things are priced a certain way because the market says it *can* be that high, or the executive decides it *should* be. This is genuinely concerning when it happens in healthcare. Take, for instance, Martin Shkreli[[9]](#footnote-9) who increased the price of a medication used to help treat toxoplasmosis from $13.50 to $750 a tablet. This was a life-saving drug. It was a more extreme case than usually seen,[[10]](#footnote-10) and he was charged (Raymond). To help keep more of these scenarios at bay, companies should look to have people from various economic backgrounds in leadership and decision-making roles.

To start this process, a corporation should offer scholarships in areas where there is poverty, to help break that barrier. By investing in someone’s future, they are investing in technologies that can increase their bottom line. It may also happen that a student awarded such a scholarship might wish to work with the company that grants it.

And young diverse populations should go for these types of opportunities. They should research what it means to age and what agism means, as both the young and the old experience it in separate ways. They should determine how to stay healthy and plan for the future. And they should enter the field of biogerontology to keep the playing field fair in the future, for themselves, and for their communities.

As an example on why young people are important here, one of the issues against the study of biogerontology is the “immortal dictator” argument. Firstly, biogerontology is not based upon immortality. A dictator would eventually die. Secondly, as is in North Korea, the death of one dictator can simply mean a new dictator (Madden). Usually, dictatorships are taken down not by the natural death of the tyrannical leader, but by revolution (Freeman). Often, other countries must get involved.

In 1976, Soweto, children took to the streets to protest being taught in the language of their oppressors (Sherrod). Within 3 years the apartheid began working on reform. In 1996-97, University students protested the regime of Milosevic. This began its downfall (Prosic-Dvornic).

We need people to join biogerontology who care about a variety of issues to help make sure that issues like this are addressed. Young generations have been a large part of activism for centuries. Recruiting young activists, people from different backgrounds, that is how we avoid some of the arguments about living longer.

Young people are a catalyst of change that should be introduced to the world of biogerontology. It is a growing field with tons of opportunity, which is incredibly attractive to someone who has so many years ahead of them. Young people provide new perspectives. They also have lots of time for the longer studies that lifespan research requires. Preclinical work on aging usually involves lab animals. Most commonly this is the lab mouse. A preclinical trial using mice on average can take up to seven years to complete. Mice usually live three or four years, so it takes a couple rounds to make sure your research is done well. After the mice trials, one can apply to work on a human trial. These can take five to seven more years but that is not the longest that this kind of research can take (Larkindale).

One of the longest studies is the Baltimore Longitudinal Study of Aging. This study began in 1958 and is still running. The basis of the study is that everyone ages differently and there are numerous aspects as to how we do age. They seek to study what counts as normal aging. Normal aging is the process of aging separated from different factors like education, disease, social standing, and economic disadvantage. This can take some time to discover, in fact it can take a whole lifetime (NIA).

Another good reason for more young people to join the field of biogerontology is perhaps the very reason some are not interested in it. “Live Fast, Die Young” is a phrase created by Willard Motley and a song by Hollywood Undead. Indeed, this sentiment has spread throughout the world. It is the argument for a fast and intense life, versus a slow and modest one. It is idealized through media for young people, by young people (Helmore).

A psychologist at the University of Illinois did a study on what they call the “James Dean effect” and found that shorter and happier lives were preferred to the perceived not quite as happy but still positive longer lives. Part of that may be the lack of knowledge on longevity, and the perceived notions of what aging means. Many people feel that once someone becomes 65, they are a burden and less productive (Meyer). This is a form of agism. If one were to study life and the possibility of maintaining a healthspan well into the eighties or older, it would help change the view of what age is considered old, and what being old actually means.

To recruit young people into the field, experts can go to high schools and give presentations on the field of longevity when people are most curious and yearning for something interesting. While it does take time and effort outside of normal job requirements, it may be worth it to bring in new and innovative ideas.

The field of living longer, healthier lives needs more young people for new perspectives and more time and opportunity to see their work come to fruition. It needs more economically diverse people to have a say in pricing of technologies. More people from different ethnicities to help with fair distribution amongst communities. Jeremy Levin said this about having diverse backgrounds working at his company “It was that you had this enormous set of different lenses looking at the same problem.” It is valuable to be able to see something from different sides like that (Bio Digital).

Often, current scientists in science act as gatekeepers to the community. They bring with them prejudices from the outside. One reason that some who enjoy science would shy away from the biogerontological field is that they may not feel accepted by it. The less diverse a field is, the more likely it is that they will experience discrimination – whether on purpose or not.

Companies and foundations need to work towards diversity and inclusion. They can do this in several ways. They can recruit in areas where they are likely to achieve this diversity, create pipelining programs for young or newly graduated individuals, and they can work towards generating interest within the average layman by posting about in public forums.[[11]](#footnote-11)

Diversity is an important part of a successful workplace. It helps ensure a more equal world. If biogerontology remains in its current state, it will never reach the full potential it could. In fact, not seeking out to provide an inclusive atmosphere for people of all backgrounds could have some frightening repercussions where who lives past 100 and who dies young becomes based on race or wealth.

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1. More on that to come. [↑](#footnote-ref-1)
2. More information than what is in this paper can be found in the World Inequality Report [↑](#footnote-ref-2)
3. Like mercury. [↑](#footnote-ref-3)
4. They called the other group the Meat Puppets. [↑](#footnote-ref-4)
5. This is called apoptosis. [↑](#footnote-ref-5)
6. Without even going into gender or economic differences. [↑](#footnote-ref-6)
7. Meritocracy meaning your work is only judged by its merit (quality/importance to the field). [↑](#footnote-ref-7)
8. Probably not wise to test out this ‘opportunity:’ Jesselyn Cook. “Notorious ‘Young Blood’ Doctor Claims Dead Patient Faked His Own Death.” *Huffington Post*, 3 Oct. 2019, www.huffpost.com/entry/ambrosia-doctor-jesse-karmazin-false-claim-patient-faked-death\_n\_5d955bb6e4b0da7f66215584. [↑](#footnote-ref-8)
9. PharmaBro [↑](#footnote-ref-9)
10. Though price gouging in the medical field is not unheard of: Another example being EpiPen’s. [↑](#footnote-ref-10)
11. I highly suggest using memes. [↑](#footnote-ref-11)