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Chairman Nelson, ranking member Collins and members of the special committee, thank you for inviting amfAR to participate in today's hearing on Older Americans: The Changing Face of HIV/AIDS in America. I am pleased to share our views on the difficulties - and the opportunities - of this growing challenge in the United States.

By 2015, there are projected to be half a million people living with HIV over the age of 50. Some of these will be people who have been living with HIV infection for many years or even decades, and others will be people who are newly infected. They will all face the difficulties of aging, and of doing so with a serious and potentially fatal disease.

For many years, we never expected to have to deal with HIV infection in older Americans. The good news is that research has given us antiretroviral therapy, which has dramatically lengthened the lives of those living with the infection. A young person who is infected today, and who enters into and stays in medical care, can expect a lifespan that may not differ dramatically from that of a person who does not have HIV. While this is good news, it means that increasing numbers of people living with HIV are older than ever, and our challenge is that we do not know enough about the biological causes and consequences of aging with HIV infection, or about the social burdens borne by those living with HIV. Hundreds of thousands of people will be entering into a phase of their life in which they and their caregivers are not sure whether their health issues are due to HIV infection or aging, or how these challenges should be met. Meanwhile, many older Americans are unaware of their own risk for acquiring HIV, or how to deal with the stigma of being an older person with a disease that is, even today, more commonly associated with young people.

Aging with HIV is at the intersection of several of the most pressing health challenges that face Americans who are aging. These include cardiovascular disease, cancer, osteoporosis, liver and kidney

disease, hepatitis C and neurological diseases like dementia. People living with HIV face an increased rate of all of these diseases, and at a younger age, than those who do not have HIV.

Teasing apart the contribution of HIV versus its treatment towards the increased risk for these diseases is difficult, but most researchers believe the virus plays a pivotal role. While studies have found higher rates of cardiovascular disease in HIV-infected populations than in age-matched HIV-uninfected populations, the mechanisms underlying this difference are not fully understood. However, we know that patients who can control their virus even in the absence of antiretroviral treatment have higher rates of carotid disease. Several cancers that are believed to be caused by chronic infections, such as anal cancer, Hodgkin's disease and liver cancer, occur at a higher than expected rate. The dysfunction in the immune system caused by persistent HIV infection is believed to be the major contributor to these higher rates of cancers. Liver and kidney disease are particularly problematic, as the virus can cause damage to these organs, either directly by viral replication or indirectly by destroying immune cells. These tissues are also susceptible to damage caused by all medications, including those used to treat HIV infection. The same is true for bone weakness and damage manifested as osteoporosis and probably caused by a combination of the virus and the drugs used to treat it.

Underlying all of these diseases is the aging of the immune system itself. Older adults, even in the absence of HIV, experience a reduction in the ability of stem cells to develop into immune cells; a shrinking of the thymus, a key organ that generates new immune cells; a skewing of existing immune cell populations away from the ability to respond to new infections; and an increase in the production of hormones that lead to immune inflammation and perpetuate the cycle of the loss of ability to respond to new infections.

Evidence from the HIV research field suggests that inflammation, an increase in cellular and hormone activity in the immune system, occurs in both aging and in HIV infection. Older Americans living with HIV are therefore subject to immune inflammation on two counts. Both for aging as well as in HIV, it is believed to be a major cause of damage to blood vessels and for the increased risk of heart disease. Any research that can shed light on the process of inflammation in HIV disease will by definition benefit millions of Americans who will face heart disease now and in the future.

Researchers currently believe that many of the manifestations of this inflammation of the immune system pose a significant barrier to our ability to cure HIV. Therefore, a greater understanding of the fundamental cellular processes underlying aging, such as inflammation, will help us to address many, perhaps even most, of the diseases that take the lives of older Americans living with - or without - HIV

and may at the same time help us to achieve one of the greatest medical challenges of this century, namely curing an infection that has taken the lives of tens of millions of people around the world.

Robust support for a strong research agenda will be crucial to understanding and addressing these challenges. Research will help us understand how to reach older Americans and provide them with the information and support they need to prevent HIV infection. It will also allow us to improve our HIV testing outreach so that all people who are infected know their status and enter into appropriate medical care. Once we bring people into care, research will help us to provide new and improved tools to help treat not only the HIV but also all of the other diseases we most often associate with aging but that occur more frequently in HIV infection.

Research has resulted in drugs that are saving the lives of millions of HIV-infected people around the world. The fact is that many new treatments for diseases such as cancer, heart disease, hepatitis, and osteoporosis have also arisen from research aimed at preventing, diagnosing, and treating AIDS. Protease inhibitors, initially developed to treat HIV, are now being tested in the treatment of cancers, for example breast cancer. Treatments developed for Kaposi's sarcoma are now being tested in bladder, vulvar, breast and colon cancer. Some cancers require treatment by transplantation, and the immune suppression can lead to opportunistic infections such as cytomegalovirus and pneumocystis pneumonia. Treatments for those infections came out of AIDS research. Protease inhibitors are also being tested in the treatment of Alzheimer's disease. Along with nucleoside analogs, which were also developed for treating HIV, protease inhibitors are also used to treat and even cure hepatitis C.

Biomedical research saves lives, generates economic benefits, and yields scientific insights that catalyze future medical breakthroughs. Although the U.S. has long been recognized as the world leader in biomedical research, stagnant funding (which translates into actual funding reductions when adjusted for inflation) imperils U.S. leadership and jeopardizes future life-saving research advances. Funding for health research at the National Institutes of Health (NIH) lost 22 percent in purchasing power in the decade from 2003 to 2012. The federal budget sequester, which went into effect March 1, 2013, resulted in an inability to fund 700 worthy research projects. Limited funding will inevitably delay (and in some cases prevent altogether) exploration of potentially transformative new approaches to understanding and treating the leading causes of death and disability.

When we invest in HIV research, we are committing to understanding and solving health challenges faced by millions of aging Americans. This committee is well aware that the population of this country is growing older and that tens of millions of people will face the serious health issues being discussed here today. The benefits accruing from an investment in AIDS research spread well beyond those with HIV in

ways we may not initially predict, but which have a track record of improving the health outcomes for millions of Americans. amfAR strongly supports an increase in funding for the NIH and for research on HIV and aging, understanding that the knowledge we gain from such research has the potential to touch on the lives of all of us.

Thank you again for giving amfAR the opportunity to testify on this important topic. I would be happy to answer any questions you may have.