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Italian and U.S. researchers look to the future and explore aging-related issues

7 November 2017

- Researchers in Italy and the United States predict that by 2035, three-quarters of HIV-positive people in both countries will be over the age of 50.
- 90% of HIV-positive older people will have at least one non-communicable disease such as high blood pressure, elevated lipids, diabetes, or cancer.
- HIV care costs attributable to non-communicable disease are expected to double in Italy and increase 40% in the United States.
- Researchers call for “multidisciplinary patient management” and geriatric medicine training for doctors who care for people living with HIV.

Researchers in Canada and other high-income countries increasingly expect that many people who take combination anti-HIV treatment (ART) every day *and* achieve and maintain an undetectable viral load *and* keep up with regular clinic and laboratory visits will achieve a near-normal life span. In light of this tremendous effect of ART on people's life spans, ministries and departments of health should begin planning for the care that will be required by a growing proportion of aging HIV-positive people. A first step in this process is estimating which diseases and health conditions are occurring in older HIV-positive people now, and then projecting these estimates into the future and calculating their costs.

A team of researchers in Italy and the United States has collected health-related information from about 11,000 HIV-positive people and used this to produce a computer model that could explore some effects of aging. The computer model focused on non-communicable diseases (NCD) and projected health outcomes for aging HIV-positive people in both countries, comparing the years 2015 and 2035.

The computer model predicted that in 2035 the average age of HIV-positive people in Italy will be nearly 60 years and in the U.S. it will be 58 years. Furthermore, it predicted that nearly 90% of HIV-positive older people will have at least one of the following NCDs in 2035:

- higher-than-normal blood pressure
- elevated levels of lipids (cholesterol and/or triglycerides) in their blood
- diabetes
- cancers unrelated to HIV

To a lesser extent, there will also be increases in heart attacks and strokes.

The researchers therefore predicted that the cost of caring for HIV-positive people will likely rise due to the increased presence of NCDs. The model likely underestimates some of the costs of care, as it takes into account only a handful of NCDs. The research team also made recommendations for interventions to reduce NCDs among older patients and for enhancing the training of doctors and nurses so they can better help look after an aging population.

Study details

The research team adapted a well-validated model previously used in the Netherlands to explore aging among HIV-positive people in that country. The researchers used data from an ongoing study in Italy called ICONA, which is focusing on 7,499 HIV-positive people. Data from the U.S. were obtained from 3,748 HIV-positive people with private

insurance coverage from a nationally representative sample.

The researchers' model focused on the following NCDs:

- abnormal lipid levels in the blood
- higher-than-normal blood pressure
- type 2 diabetes
- chronic kidney disease
- cancers unrelated to HIV
- heart attack
- stroke

Results—What the future likely holds

By the year 2035, the model predicted the following:

Italy

The average age of HIV-positive patients will be nearly 60 years.

U.S.

The average age of HIV-positive patients will be 58 years.

The proportion of patients who are aged 50 years or older will be as follows:

- Italy - 76%
- U.S. - 74%

The proportion of patients who are aged 65 years or older will be as follows:

- Italy - 29%
- U.S. - 27%

Focus on non-communicable diseases

According to the researchers, in 2035 “the increasing burden of NCDs will be driven by” the following:

- higher-than-normal blood pressure
- abnormal lipid levels in the blood
- type 2 diabetes
- cancers unrelated to HIV

The proportions of HIV-positive people who had these conditions in 2015 are as follows:

Higher than normal blood pressure and elevated lipid levels

- Italy - 60%
- U.S. - 61%

Type 2 diabetes

- Italy - 9%
- U.S. - 12%

Cancers unrelated to HIV

- Italy - 6%
- U.S. - 14%

The computer model predicted that the following proportions of HIV-positive people will have NCDs in 2035:

Higher-than-normal blood pressure and elevated lipid levels

- Italy – 85%
- U.S. – 84%

Type 2 diabetes

- Italy – 27%
- U.S. – 23%

Cancers unrelated to HIV

- Italy – 16%
- U.S. – 30%

When researchers assessed trends in heart attacks and strokes, they expected the following proportions of people to have one or more of these conditions in 2035, as follows:

- Italy – 10%
- U.S. – 21%

This difference in rates of serious cardiovascular disease between the two countries is, according to the researchers, “driven by the higher age-specific prevalence and incidence of serious cardiovascular disease observed in the U.S. compared to Italy.”

Costs of managing NCDs expected to rise

The researchers estimated the annual costs of care directly related to NCDs and found that the computer model suggested it would increase between 2015 and 2035 in both countries, as follows:

Italy

The researchers estimated that currently 11% of the cost of caring for HIV-positive people arises from treatment of NCDs. By 2035 this figure is expected to rise to almost 23%. The greatest proportion of this increase will be due to the cost of care associated with abnormal lipid levels and chronic kidney disease.

U.S.

The researchers estimated that currently 40% of the total costs of care for HIV-positive people arises from treatment of NCDs. By 2035 this figure is expected to rise to almost 56%.

These findings are supported by studies in the Netherlands, which also suggest that NCDs and in particular cardiovascular disease (and its cost) will increase as HIV-positive people age.

The need to prevent NCDs

According to the researchers, “The aging of the HIV-positive populations in Italy and the U.S. will have major implications for HIV care. Our forecasts suggest that three-quarters of HIV-positive patients on ART will be over 50 years in both countries by 2035, resulting in an increased NCD burden in this population.” Recall that the main drivers of this burden of NCDs will be as follows:

- higher-than-normal levels of blood pressure
- abnormal lipid levels in the blood
- type 2 diabetes
- cancers unrelated to HIV

Furthermore, the researchers said:

“These shifts [toward NCDs] will have considerable implications for direct HIV care costs, with average care costs attributable to NCD treatment expected to double in Italy and increase by 40% in the U.S. Evidence-based

approaches on effective prevention interventions and treatment protocols will be vital to mitigate this growing burden.”

A change in health management

In high-income countries, as patients initiate ART earlier in the course of HIV disease, care provided by doctors, for the most part, continues to shift from preventing the life-threatening infections that are the hallmark of AIDS to what the research team called “the long-term prevention, screening and treatment of NCDs.” The researchers underscored that as this shift continues the following aspects of care and treatment will need particular attention:

- choice of the best ART regimen
- management of interactions between ART and medicines used to prevent and treat NCDs
- adherence not just to ART but also to NCD medicines

As patients age, the researchers call for “multidisciplinary patient management” focusing on the following elements of optimal health:

- principles of geriatric medicine
- personalized treatment protocols
- interventions with patients to help prevent or minimize the effects of NCDs, such as guidance on risk factors that can be modified (quitting smoking, dietary changes, exercise and so on)

To help effect these changes, the researchers call for training in geriatric medicine to become available for healthcare providers, particularly family medicine specialists.

The publication of the model’s results should stimulate other countries and regions to conduct their own assessments of the trajectories of people with HIV as they age and which NCDs need to be prevented and treated.

Bear in mind

There are several issues that may affect the present model’s accuracy:

- Researchers focused on a handful of NCDs. Future computer models could add other NCDs such as asthma, chronic obstructive pulmonary disease, obesity and so on.
- Researchers did not take into account cognitive impairment, which can occur because of HIV and also because of aging.
- The U.S. data came from patients who had private health insurance coverage that provided what the researchers called “the best access to health care.” Such patients might be healthier than patients who rely on public health programs or those without health insurance.

These and other reasons suggest that the computer model is likely to have underestimated future NCDs and associated healthcare costs.

Resources

CATIE Resources

[Frailty, nerve injury and falls in middle-aged and older HIV-positive people](#) - *CATIE News*

[Factors linked to falling in HIV-positive women](#) - *CATIE News*

[Nerve pain and numbness](#) from *A Practical Guide to HIV Drug Side Effects*

[Unravelling the complexity of HIV and fatigue](#) - *CATIE News*

[Alberta researchers warn about increasing costs of HIV care](#) - *CATIE News*

[Emerging issues in older HIV-positive people](#) - *TreatmentUpdate 214*

[Older people with HIV face different long-term health challenges](#) - *CATIE News*

[Denmark—unexpected trends in use of psychotropic medicines](#) - *TreatmentUpdate 204*

[Impressive gains in survival for older people with HIV but still less than general population](#) - *CATIE News*

[Danish study raises questions about accelerated aging in HIV](#) - *CATIE News*

[Long-term HIV infection and health-related quality of life](#) - *CATIE News*

[Dutch doctors explore intersection of aging and HIV](#) - *CATIE News*

[Geriatric syndromes found to be common among some people with HIV](#) - *CATIE News*

[Strengthening the aging brain](#) — *TreatmentUpdate 203*

[Longer life expectancy for HIV-positive people in North America](#) - *TreatmentUpdate 200*

[HIV and aging](#)  - Healthy living tips for people 50 and over living with HIV

[Mental Health](#) from *HIV in Canada: A primer for service providers*

Non-CATIE resources

[HIV and Aging: State of Knowledge and Areas of Critical Need for Research. A Report to the NIH Office of AIDS Research by the HIV and Aging Working Group](#)

[Quantification of biological aging in young adults](#) - *Proceedings of the National Academy of Science USA*

[Management of Human Immunodeficiency Virus Infection in Advanced Age](#) - *Journal of the American Medical Association*

[“America’s other drug problem: Giving the elderly too many prescriptions.”](#) - *Washington Post*

[The CIHR Comorbidity Agenda](#) - Canadian Institutes of Health Research (CIHR)

[CIHR’s HIV Comorbidity Research Agenda: Relevant Research Areas](#)

[Factsheets on HIV and aging in Canada](#) - Canadian AIDS Society

[HIV & Aging: A 2013 Environmental Scan of Programs and Services in Canada – Community Report](#)  - realize (formerly the Canadian Working Group on HIV and Rehabilitation – CWGHR)

[Directory of Promising Programs and Services for Older People Living with HIV in Canada](#)  - realize

[Evidence-informed recommendations for rehabilitation with older adults living with HIV: a knowledge synthesis](#) - *BMJ Open*

—Sean R. Hosein

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2. Smit M, van Zoest RA, Nichols BE, et al. Cardiovascular disease prevention policy in HIV: recommendations from a modelling study. *Clinical Infectious Diseases* . 2017; *in press* .
3. Smit M, Brinkman K, Geerlings S, et al. Future challenges for clinical care of an ageing population infected with HIV: a modelling study. *Lancet Infectious Diseases* . 2015 Jul;15(7):810-8.

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Production of this content has been made possible through a financial contribution from the Public Health Agency of Canada.

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