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## Ageing Society in Developed Countries Challenges Carbon Mitigation

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Western countries are ageing, meaning a larger proportion of their citizens will be of senior age (60+) in the years ahead. However, the impacts of the lifestyles of these senior-aged people on global carbon mitigation are poorly understood. Here, we quantify the evolution of greenhouse gas (GHG) footprints driven by household consumption across age groups. We found that the senior-aged group has played a leading role in driving up GHG emissions in the past decade. The senior age group in most of the 32 developed countries studied was on the way to becoming the largest contributor to those countries' GHG emissions, with their shares of the national total consumption-based emissions increasing from 25.2% to 32.7% between 2005 and 2015. The seniors in the US and Australia have the highest per capita footprints, twice the Western average. The trend was mainly due to the changes in expenditure patterns of seniors, such as high expenditure on carbon-intensive products (e.g. heating and cooling larger home area per capita). The high level of spending of seniors was strongly supported by their accumulated wealth. However, their wealth elasticity of expenditure is lower than other age groups, suggesting the consumption pattern may have a relatively small change while their wealth is gradually shrinking. The increasing carbon footprints of senior citizens is likely to drive the domestic production due to their higher share of expenditure for shelter energy and food products, thus having limited effects on international carbon leakage. The demographic change poses more challenges in local mitigation and calls for deeper public mitigation efforts, especially for the US.