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Title: Global impacts of meat trade on non-communicable diseases

Non-communicable diseases (NCDs) – the chronic human health problems such as cardiovascular diseases linked to poor diets – are significant challenges for sustainable development and human health. Global meat trade facilitates accessibility to cheap animal products that may increase diet-related NCDs worldwide. In the Sustainable Development Goals, chronic diet-related NCDs have been ranked as one of the core components that link human health and sustainable development. However, little is known about the different impact of global meat trade on chronic diet-related NCDs across different countries. Using comprehensive datasets of 14 red meat and 6 processed meat items across 135 countries from 1995 to 2013, this study focused on how meat trade differently affects the risks of three diet-related NCDs (colon and rectum cancer, diabetes mellitus, and ischemic heart disease) across countries. We also examined which socioeconomic and environmental factors contribute to meat trade. From 1995 through 2013, global meat trade increased by 80% from 10.7 Mt to 19.3 Mt. With the meat imported over the 19 years, developing countries increased 120.2% of NCD deaths and 149.2% of NCD disability-adjusted life years (DALYs), while developed countries decreased 2.7% of NCD deaths and 0.2% of NCD DALYs. Developing countries that are the former communist and socialist states in Europe have rapidly increased age-standardized NCD death rates from meat imported. The most important factor behind the global meat import was the increases in population size. Furthermore, per capita GDP had a positive association with the quantities of red meat imported, while the number of free trade agreements between countries was positively associated with the quantities of processed meat imported. Our results suggest that new governance that incorporates separate international efforts, improved national policies, and the nurturing of individual efforts is needed to decrease NCD risks, particularly in developing countries.