Global trends in risk factors for non-communicable diseases

This brief shares the findings from a series of worldwide inventories conducted with the aim of mapping non-communicable diseases. NCD-RisC has collected and analysed data from over 2,545 population-based studies in almost 200 countries, including data delivered by the Amsterdam Institute for Global Health and Development (AIGHD) and PharmAccess.

The Non-Communicable Disease Risk Factor Collaboration (NCD-RisC) is a global network of health scientists that provides data on risk factors for NCDs in 200 countries and territories. Working closely with the World Health Organization, NCD-RisC pools high-quality population-based data using advanced statistical methods, designed specifically for analyzing NCD risk factors.

NCD-RisC's series of worldwide inventories aims to identify risk factors for NCDs like cardiovascular disease, which can lead to heart attacks and stroke. It currently has data from over 2,545 population-based surveys from 193 countries since 1957, including the risk factor levels of nearly 129 million participants. The four risk factors it has singled out are:

- height;
- body-mass index;
- blood pressure;
- diabetes.

This brief reports on key findings, as presented in a series of publications in eLife, the International Journal of Epidemiology and The Lancet. In general, it can be concluded that risk factors for non-communicable disease are increasing in most part of the world, particularly in Africa.

Data contributed by PharmAccess and AIGHD

Global health issues require scientific rigor to define the size and scope of challenges and provide robust evidence if and how interventions work. For this reason, PharmAccess commissioned AIGHD to conduct impact evaluations of several programs in sub-Saharan Africa.

In order to ensure the unique data collected during these impact evaluations could have a broader impact than on PharmAccess programs alone, PharmAccess and AIGHD shared several datasets with NCD-RisC:

- A survey in **rural Nigeria** included a representative, population-based sample in Kwara State. Data collected in 2009.
- A survey in **Namibia** including a representative sample of the population of greater Windhoek. Data collected in 2009.

Human height

Height in early adulthood provides a measurable indicator for sustainable development, with links to health and longevity, nutrition, education and economic productivity. To estimate the mean height of people born between 1896 and 1996, researchers re-analysed 1,472 population-based studies, using the height measurements of more than 18.6 million participants in 200 countries.

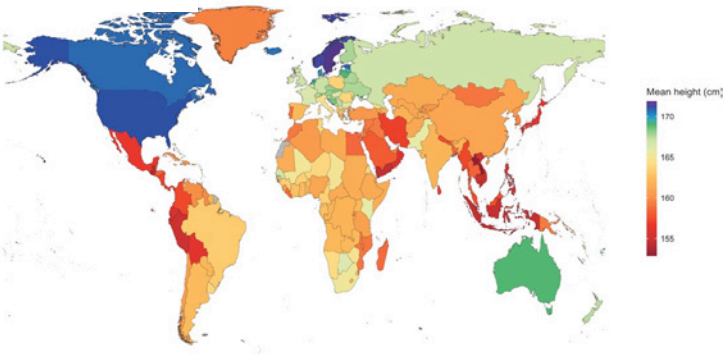
Average height differences between countries may be partly due to genetics, but most differences have other causes like malnutrition or suffering from serious diseases. Taller people generally live longer and are less likely to suffer from heart disease and stroke. Taller women and their children are less likely to have complications during and after birth.

The analysis revealed large differences in height between countries. The tallest men were born in the Netherlands in the last part of 20th century and were nearly 183 cm tall on average. The shortest women were born in Guatemala in 1896 and were on average 140 cm tall. The difference between the countries with the tallest and shortest people was about 20 cm for both men and women. This indicates there are large differences between countries in terms of nutrition and the risk of developing diseases.

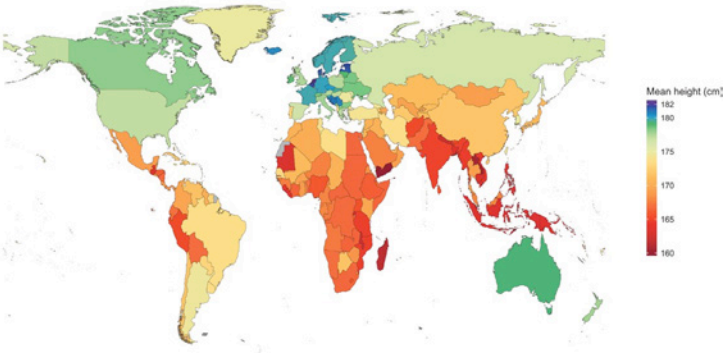
The way in which height has changed over the past 100 years also varies from country to country. The largest gains in height occurred in Iran and South Korea: Iranian men born in 1996 were around 17 cm taller than those born in 1896, and South Korean women were 20 cm taller. In contrast, there has been little change in some sub-Saharan African countries and in South Asia over the century of analysis.

Fig. 1: Change in adult height between the 1896 and 1996 birth cohorts.

1896 birth cohort



1996 birth cohort



There is a need to better understand why height has changed in different countries by different amounts, and use this information to improve nutrition and health across the world.

** Publication: A century of trends in adult human height. NCD Risk Factor Collection (NCD-RisC). eLife 2016;5:e13410*

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Body-mass index

Both underweight and obesity are associated with increased risk of adverse health outcomes, including increased NCDs. 1,698 population-based data sources were used in this analysis, with body-mass index (BMI) measurements of more than 19 million adults in 186 countries.

Between 1975 and 2014, the global prevalence of underweight decreased, from 13.8% to 8.8% in men and from 14.6% to 9.7% in women. However, underweight remains prevalent in the world's poorest regions. South Asia had the highest prevalence of underweight in 2014, with 23.4% of men and 24% of women underweight.

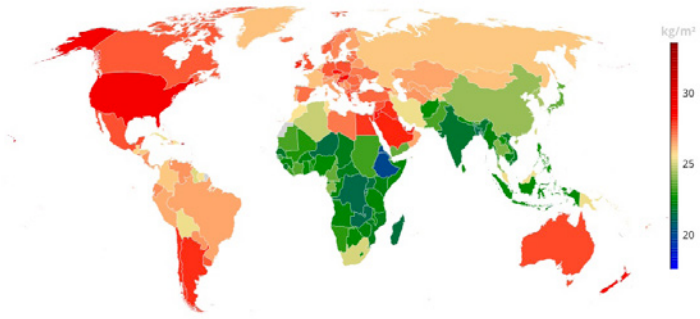
Within that same period, the mean BMIs and the prevalence of obesity increased in both men and women. Prevalence of obesity increased from 3.2% in 1975 to 10.8% in 2014 in men, and from 6.4% to 14.9% in women. The highest BMIs were found in Polynesia and Micronesia.

If post-2000 trends continue, global obesity prevalence will reach 18% in men and surpass 21% in women by 2025; severe obesity will surpass 6% in men and 9% in women.

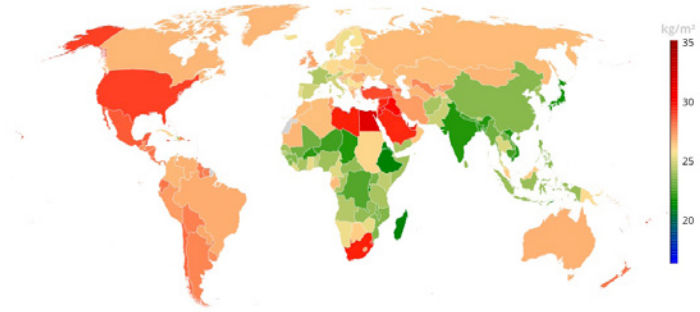
** Publication: Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. NCD Risk Factor Collection (NCD-RisC). Lancet 2016;387:1377-96*

Fig. 2: Mean BMI for both men and women, 2016.

Men 1996



Women 1996



Obesity and diabetes

NCD-RisC estimated trends in BMI and the prevalence of diabetes in African countries from 1980 to 2014. Obesity and diabetes are rapidly growing health problems in Africa.

Data were pooled from population-based studies that measured height, weight, and biomarkers to assess diabetes status in adults across five African regions. The analysis was based on 245 population-based surveys (1.2 million participants) for BMI and 76 surveys (182,000 participants) for estimates of the prevalence of diabetes.

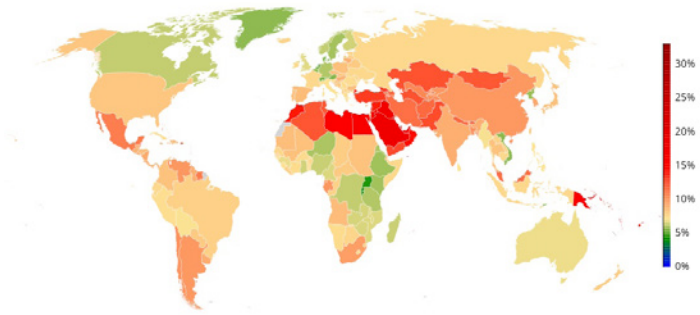
Mean BMI in Africa increased during the period 1980-2014, both in men and women. Diabetes prevalence also increased, from 3.4% to 8.5% in men, and from 4.1% to 8.9% in women. There appears to be a relationship between BMI levels and prevalence of diabetes in both men and women.

Estimates in North and Southern African regions were higher than the global average while those in Central, Eastern and Western Africa were lower than the global average. These estimates confirm the rapidly increasing burden of diabetes across Africa, a rise driven at least in part by increasing overweight.

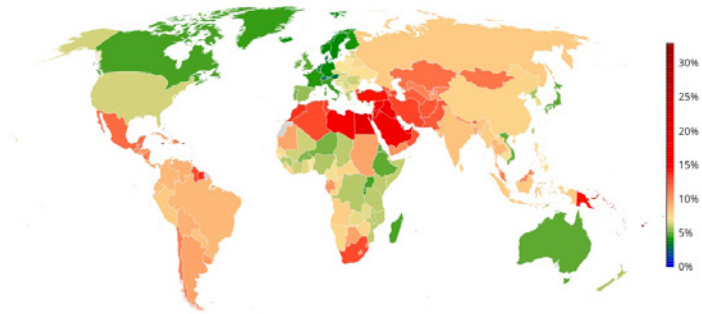
** Publication: Trends in obesity and diabetes across regions in Africa from 1980 to 2014: a pooled analysis of population-based studies. NCD Risk Factor Collection (NCD-RisC) – Africa Working Group. Int J Epidemiol 2017, 1–12, doi: 10.1093/ije/dyx078*

Fig. 3: Diabetes in both men and women, 2014

Men 2014



Women 2014



Blood pressure

Raised blood pressure is an important risk factor for cardiovascular diseases and chronic kidney disease. NCD-RisC pooled 1,479 studies that measured the blood pressure of 19.1 million adults.

The researchers calculated the contributions of changes in prevalence versus population growth and ageing to the increase in the number of adults with raised blood pressure.

The number of adults with raised blood pressure increased from 594 million in 1975 to 1.13 billion in 2015. The global increase in the number of adults with raised blood pressure is a net effect of increase due to population growth and ageing, and decrease due to declining age-specific prevalence. In 2015, the global prevalence of raised blood pressure was 24% in men and 20% in women.

During the past four decades, blood pressure has been persistently high in Central and Eastern Europe. In 2015, Central and Eastern Europe, sub-Saharan Africa, and South Asia had the highest blood pressure levels. At the same time, the highest worldwide blood pressure levels have shifted from high-income countries to low-income countries in South Asia and sub-Saharan Africa.

** Publication: Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. NCD Risk Factor Collection (NCD-RisC). Lancet 2017;389:37-55*

Fig. 4: Raised blood pressure in both men and women, 2015.