

## NCD-RisC inclusion and exclusion criteria.

In order to produce rigorous and timely estimates on trends and risk factors for non-communicable diseases (NCDs) for over 200 countries and territories, NCD-RisC pools data from over 3,300+ high-quality population-based surveys from around the world.

The high-quality of these population-based surveys is essential in ensuring the estimates we produce are representative of the regions, countries and territories included, and that the impact of chance, bias, and confounding is minimised.

To this end, NCD-RisC has developed and implemented an inclusion and exclusion criteria, such that only high quality, representative studies are pooled.

### 1. Inclusion criteria

#### 1.1. Regions and countries

The first criteria for inclusion is that the study was conducted in one of the following UN/WHO member states:

<b>Super-region</b>	<b>Region</b>
Central and Eastern Europe	<b>Central Europe:</b> Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Hungary, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia <b>Eastern Europe:</b> Belarus, Estonia, Latvia, Lithuania, Moldova, Russian Federation, Ukraine
Central Asia, Middle East, and North Africa	<b>Central Asia:</b> Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan, Uzbekistan <b>Middle East and North Africa:</b> Algeria, Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, State of Palestine, Syrian Arab Republic, Tunisia, Turkey, United Arab Emirates, Yemen
East and Southeast Asia	<b>East Asia:</b> China, North Korea, Taiwan <b>Southeast Asia:</b> Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Maldives, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam
High-income Asia Pacific	<b>High-income Asia Pacific:</b> Japan, Singapore, South Korea
High-income Western	<b>High-income English-speaking countries*:</b> Australia, Canada, Ireland, New Zealand, United Kingdom, United States of America <b>North-western Europe:</b> Austria, Belgium, Denmark, Finland, Germany, Greenland, Iceland, Luxembourg, Netherlands, Norway, Sweden, Switzerland <b>South-western Europe:</b> Andorra, Cyprus, France, Greece, Israel, Italy, Malta, Portugal, Spain
	<b>Andean Latin America:</b> Bolivia, Ecuador, Peru

Latin America and Caribbean	<p><b>Caribbean:</b> Antigua and Barbuda, Bahamas, Barbados, Belize, Bermuda, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago</p> <p><b>Central Latin America:</b> Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Venezuela</p> <p><b>Southern Latin America:</b> Argentina, Brazil, Chile, Paraguay, Uruguay</p>
Oceania	<p><b>Melanesia:</b> Fiji, Papua New Guinea, Solomon Islands, Vanuatu</p> <p><b>Polynesia and Micronesia:</b> American Samoa, Cook Islands, French Polynesia, Kiribati, Marshall Islands, Micronesia (Federated states of), Nauru, Niue, Palau, Samoa, Tokelau, Tonga, Tuvalu</p>
South Asia	<p><b>South Asia:</b> Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka</p>
Sub-Saharan Africa	<p><b>Central Africa:</b> Angola, Central African Republic, Congo, DR Congo, Equatorial Guinea, Gabon</p> <p><b>East Africa:</b> Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, Sudan (former), Tanzania, Uganda, Zambia</p> <p><b>Southern Africa:</b> Botswana, Eswatini, Lesotho, Namibia, South Africa, Swaziland, Zimbabwe</p> <p><b>West Africa:</b> Benin, Burkina Faso, Cabo Verde, Cameroon, Chad, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo</p>

\*High-income English-speaking countries have been grouped together as they exhibit similar trends in cardiometabolic risk factors and outcomes.

Within these countries, the study must be representative of the general population, this can either be on a national, subnational, or community level. The definitions of which are below. as defined below.

- National: the study collected data from around the country with the intention the results would be nationally representative.
- Subnational: the study collected data from multiple communities e.g., 3 or more cities, 5 or more villages, or one or more provinces or states.
- Community: the study collected data from one or more communities.

Studies conducted in a single location e.g., within a single church, or community group do not fit any of the definitions above.

### 1.2. Age of participants

The second criteria for inclusion is that the study included over 5 years of age.

Any study conducted among individuals under 18 must also have data available in single year age bands.

### 1.3. Variables of interest

The fourth criteria for inclusion is that the study had demographic and one of the following health measurements available:

Category	Variables
Demographic	Age, sex, place of residence (urban/rural)
Anthropometric	Height, weight, waist circumference, hip circumference
Blood pressure	Systolic blood pressure, diastolic blood pressure
Cholesterol	Total cholesterol, low-density lipoprotein, high-density lipoprotein, triglyceride, hyper cholesterol
Glucose	Fasting glucose, haemoglobin A1c (HbA1c), postprandial glucose

Whilst not a criterion, the NCD-RisC database also pools data relating to:

1. Sample weight and corresponding sampling design variables (e.g., primary sampling unit, stratum, etc.)
2. Education (including education of participant's mother and father)
3. Income
4. Socioeconomic status
5. Smoking
6. Drinking
7. Diagnoses, including date of, and medication use associated with diagnosis.
8. Device used for each measurement
9. If available; heart rate, skin fold, platelet, C-reactive protein, fibrinogen, total iron binding capacity, ferritin, bilirubin, haemoglobin, aspartate transferase, gamma-glutamyl transpeptidase, uric acid, proteinuria, albuminuria, urine-creatinine, albumin, creatine.

This list is not exhaustive, and depending on the dataset, additional variables may be suitable to extract.

### 1.4. Sampling methodology

The fifth criteria for inclusion is that the study used a probabilistic sampling method with a defined sampling frame e.g., random, systematic, or stratified.

## 2. Exclusion criteria

The studies that meet the inclusion criteria outlined above, are then checked against the exclusion criteria.

### 2.1. Participant exclusion

The first criteria for exclusion is if a study excluded individuals based on health status, or was conducted among ethnic minorities or specific educational, occupational, or other socioeconomic groups.

As this exclusion criteria may not be definite for some studies, the following generic rules have been developed to provide guidance:

#### 2.1.1. Health status:

Any study which states it was conducted among “healthy individuals” may still be included in the NCD-RisC database.

Any study with an exclusion criterion based on non-NCD related diseases may still be included in the NCD-RisC database, depending on the number of participants excluded due to this criterion, and the prevalence of the condition of exclusion in the study’s country.

Any study with an exclusion criterion directly related to NCDs are generally excluded from the NCD-RisC database.

#### 2.1.2. Ethnicity:

Any study conducted among ethnic groups, where the ethnic groups represent over 85% of the country’s population’s ethnicity may still be included in the NCD-RisC database. Studies conducted among ethnic groups where the ethnic groups represent under 85% of the country’s population’s ethnicity are excluded from the NCD-RisC database.

#### 2.1.3. Educational, occupational, or socioeconomic groups:

Any study which excluded individuals based on educational, occupational, or socioeconomic status are exclusion.

## 2.2. Self-reported data

The second criteria for exclusion is if a study collected measurement for height, weight, hip circumference, and waist circumference that were self-reported rather than measured as part of the study.

An exception to this criterion is when height and weight measurements have been self-recorded for a child by their parent or guardian.

### 2.3. Location

For studies which recruited participants through schools, or health facilities; the following generic exclusion criteria are applied.

#### 2.3.1. Schools

School-based studies conducted in age-sex groups, within countries with a school enrolment rate of 70% or higher (as estimated by the World Bank or UNICEF) may still be included in the NCD-RisC database.

School-based studies not conducted in age-sex groups, or not within a country with a school enrolment rate of 70% or higher (as estimated by the World Bank or UNICEF) are excluded from the NCD-RisC database.

#### 2.3.2. Health facilities

Studies with a sampling frame based on health insurance schemes may still be included in the NCD-RisC database if over 80% of the study's country's population have health insurance. Studies conducted in countries where less than 80% of the population have health insurance were excluded from the NCD-RisC database.

Studies conducted within general practice and/or primary care systems may still be included in the NCD-RisC database if the study was conducted within a high-income country or an emerging economy in central Europe with universal insurance. Studies conducted elsewhere are excluded from the NCD-RisC database.

### 2.4. Glucose measurements

For studies where glucose measurements were taken, if the participants had not been instructed to fast for at least 6 hours prior to the measurements, these measurements were excluded from the NCD-RisC database.