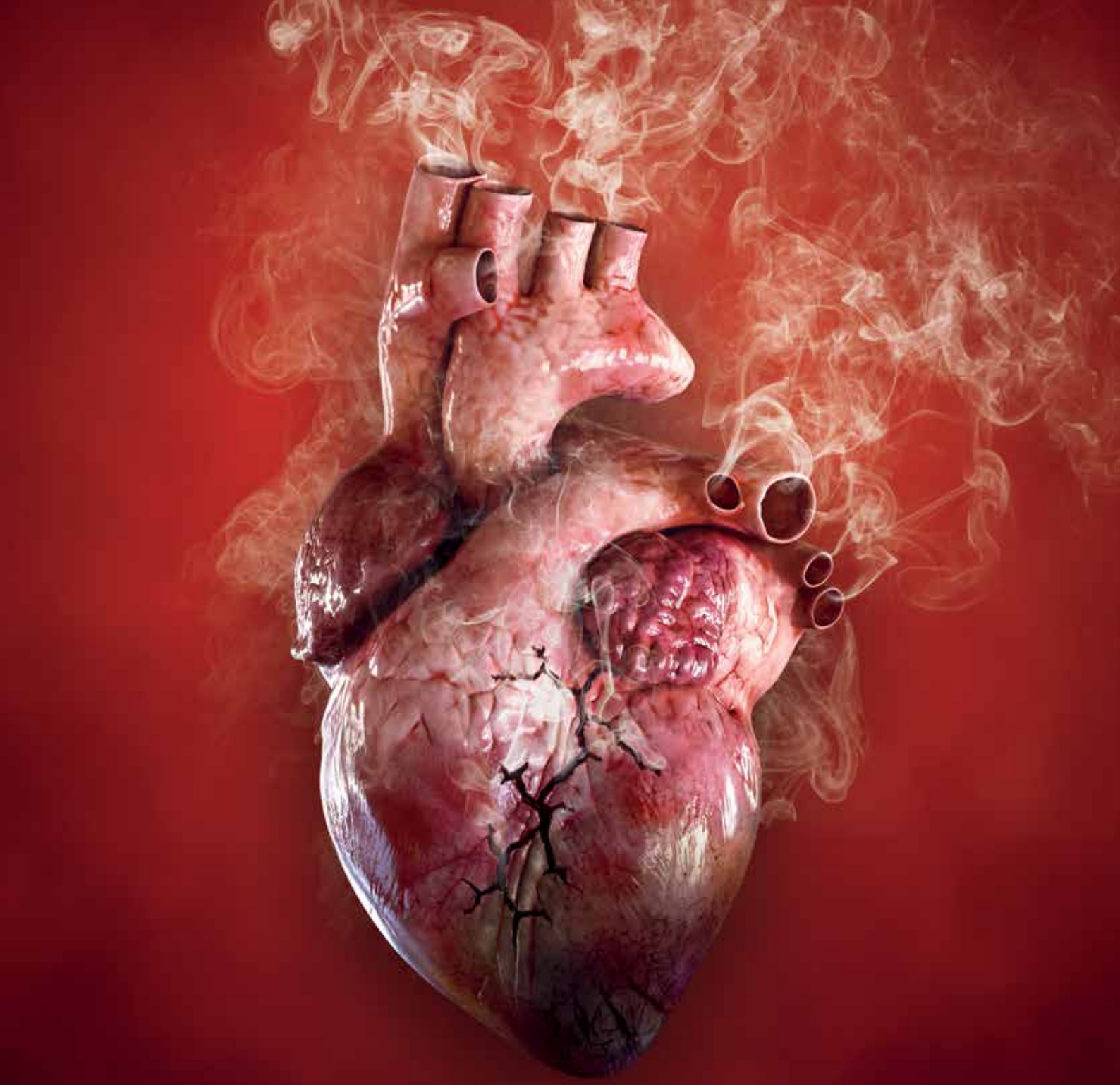

TOBACCO BREAKS HEARTS

Choose health, not tobacco

31 MAY: WORLD **NO TOBACCO** DAY #NoTobacco

TOGETHER LET'S BEAT TOBACCO #beatNCDs

WORLD HEART FEDERATION®

FCTC WHO FRAMEWORK CONVENTION ON TOBACCO CONTROL SECRETARIAT

World Health Organization

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CONTENTS

TOBACCO **KILLS**

Tobacco kills over 7 million people every year *(1)*, which means that, every day, more than 19 000 people die from tobacco use or second-hand smoke second-hand smoke exposure. Most tobacco-related deaths occur in low- and middle-income countries: populations that are targets of intensive tobacco industry marketing.

Tobacco can be deadly even for non-smokers: second-hand smoke contributes to heart disease, cancer and other diseases, causing around 890 000 premature deaths annually *(1)*.

The scale of this devastation of human health is shocking, but these deaths are preventable.

The tobacco industry continues to aggressively promote the use of tobacco products and to conceal the dangers of tobacco use, but we are fighting back to help prevent this ongoing devastation.

MAGNITUDE OF **CARDIOVASCULAR DISEASE MORTALITY**

One in three deaths worldwide is caused by cardiovascular disease (CVD) *(2)*, despite the availability of effective, inexpensive and safe treatments. In fact, CVD is the world's leading cause of death, killing around 18 million people every year *(2)*, with over 80% of these deaths occurring in low- and middle-income countries *(2)*.

TOBACCO **BREAKS HEARTS**

Tobacco use and second-hand smoke exposure are major causes of CVD *(1)*, contributing to approximately 17% of all cardiovascular deaths globally, about 3 million deaths per year *(3)*.

The cardiovascular risks attributable to tobacco smoking increase with the amount of tobacco smoked and the years of having smoked. Although there is a strong dose–response relationship between the amount of tobacco smoked per day and cardiovascular risk, the relationship is not linear *(4)*. The risk is substantially increased by exposure even to low levels of tobacco smoke, as with exposure to second-hand smoke. In fact, smoking only about one cigarette per day incurs half the risk of developing coronary heart disease and stroke incurred by smoking 20 cigarettes per day *(5)*.

SECOND-HAND SMOKE **EXPOSURE**

Exposure to second-hand smoke can cause coronary heart disease, increasing the risk of disease by approximately 25–30% *(6)*. CVD is by far the greatest cause of deaths associated with second-hand smoke; around 55% of the estimated 890 000 worldwide deaths caused by second-hand smoke are attributed to ischaemic heart disease *(1, 7)* .

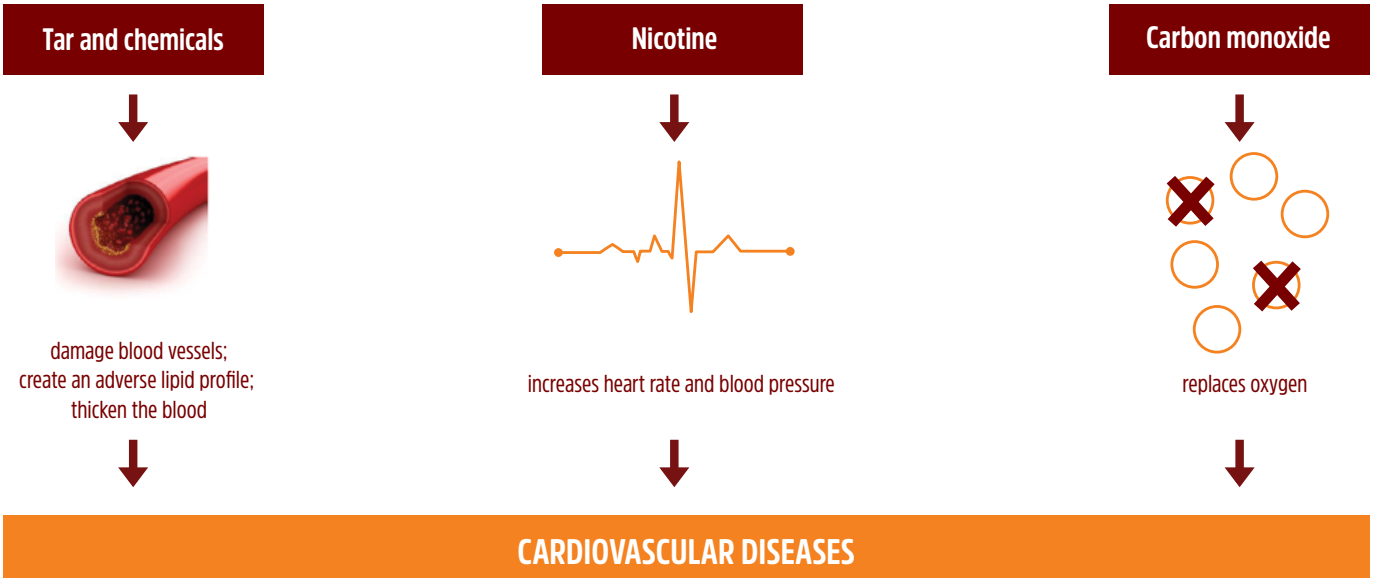
The 2014 report on smoking by the United States Surgeon General concluded that a causal relationship exists between second-hand smoke and acute cardiovascular events and that the implementation of smoke-free laws and policies significantly reduced coronary events in non-smokers under 65 years of age *(8)*.

HOW DOES TOBACCO **BREAK HEARTS?**

Tobacco smoke contains over 7000 chemicals *(4)* and is divided into two phases: a particulate phase and a gas phase *(9)*. The particulate phase of smoke contains nicotine, a highly addictive substance associated with increases in heart rate, blood pressure and myocardial contractility *(6)*, and the total aerosol residue (tar), which together contribute to heart disease through the following pathways: inflammation, impairment of the endothelium (the lining of the blood vessels), enhanced formation of clots and reduced level of high-density lipoprotein (HDL) cholesterol *(4, 9, 10)*. The gas phase contains the poisonous gas carbon monoxide, along with other gases. Carbon monoxide replaces oxygen in the blood, thereby reducing the availability of oxygen for the heart muscle and other body tissues *(4, 11)*.

These pathophysiological effects of tobacco predispose both active tobacco users and passive smokers to the formation of atherosclerosis or narrowing of the arteries, leading to various types of CVD such as ischaemic heart disease, cerebrovascular disease, peripheral artery disease and aortic aneurysm (see Fig. 1).

FIG. 1. PATHOPHYSIOLOGICAL MECHANISMS OF TOBACCO USE LEADING TO CARDIOVASCULAR DISEASE



Sources: (*9, 10, 12*)**; illustration provided by the Dutch Heart Foundation.**

SMOKELESS **TOBACCO**

All tobacco products are inherently harmful, including smokeless tobacco, which contains over 2000 chemical compounds, including nicotine *(4, 12–15)*. Heavy metals such as cadmium and other substances contained in smokeless tobacco products, and additives such as liquorice or punk ash, are reported to affect the cardiovascular system adversely *(13)*. Smokeless tobacco may also cause heart disease by acutely elevating blood pressure and contributing to chronic hypertension *(16-18)*. Reviews of studies have found associations between smokeless tobacco use and fatal myocardial infarction and stroke *(12, 14, 15, 19–21)*. Smokeless tobacco use is increasing in many parts of the world, and in some countries (e.g. Bangladesh, India) it is more commonly used than smoked tobacco *(15, 20)*.

ELECTRONIC NICOTINE **DELIVERY SYSTEMS**

Electronic nicotine delivery systems (ENDS), also known as e-cigarettes, vape pens, e-cigars or vaping devices, are battery-operated devices that heat a solution, or e-liquid, to generate an aerosolized mixture containing flavoured liquids and nicotine that is inhaled by the user *(22)*. They also emit various potentially harmful and toxic chemicals that have known health effects resulting in a range of significant pathological changes. Further, the mixture contains nicotine, which can have adverse effects during pregnancy and may contribute to CVD. The cardiovascular system is very sensitive to nicotine and these other chemicals, and the body experiences direct effects from ENDS use (e.g. narrowing of the arteries, increased heart rate and blood pressure). Also non-users, including children and young people, are at risk of CVD through second-hand vaping *(23)*. Evidence so far suggests that ENDS generally contain fewer toxicants than cigarette smoke. However, long-term health effects of use of ENDS are unknown; they are thought to increase the risk of chronic obstructive pulmonary disease, lung cancer and possibly CVD, as well as some other diseases associated with smoking. Further, it is presently unknown whether ENDS use translates into reduced cardiovascular risk in comparison with cigarette smoking.

HEATED
TOBACCO PRODUCTS

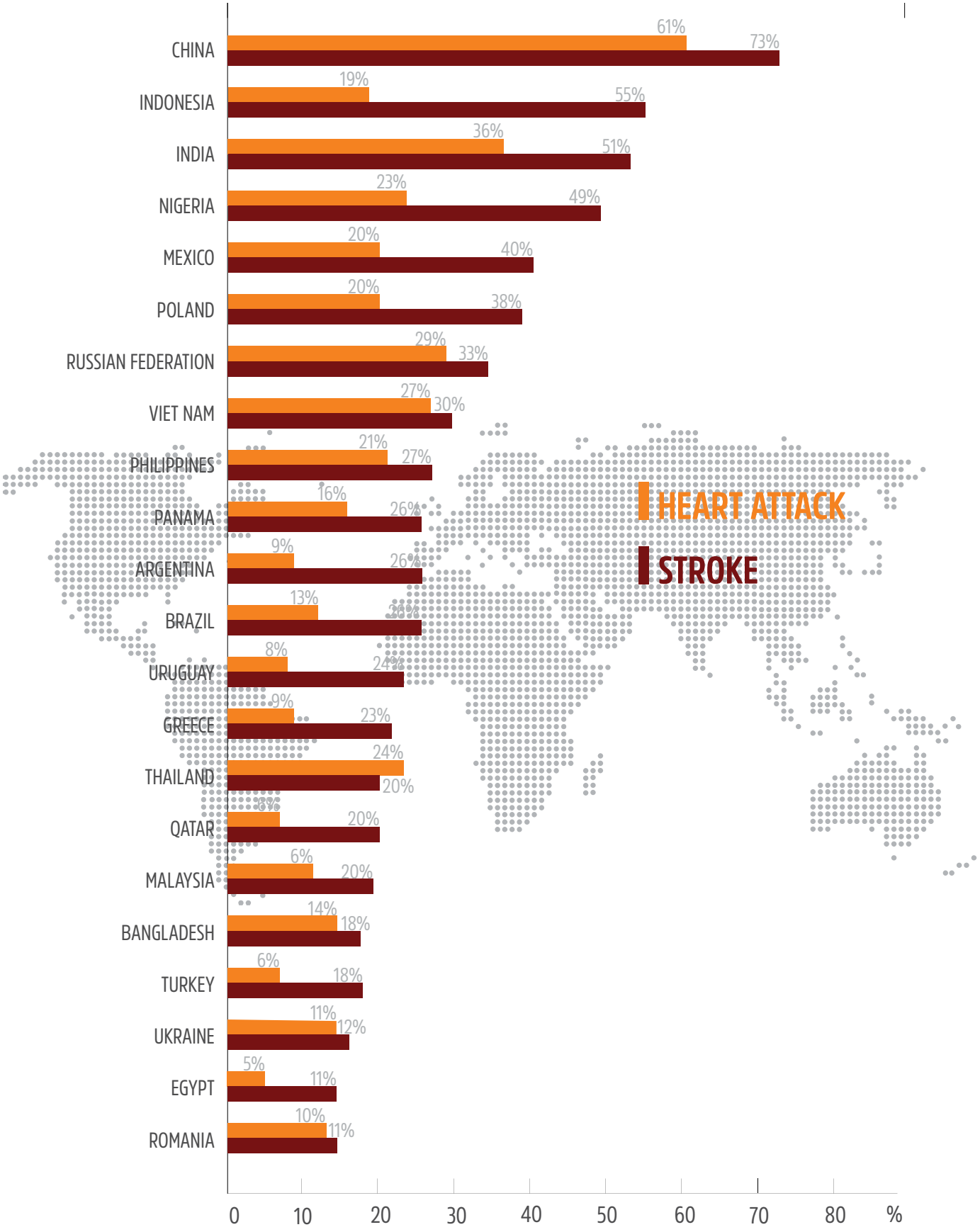
Heated tobacco products (HTP), also known as heat-not-burn (HNB) tobacco products, are battery-operated devices that heat tobacco to a lower temperature (up to 350°C) than when a conventional cigarette is burned, a process which occurs around 600°C. This causes an aerosol containing nicotine and other chemicals, leaving the leaf material intact but depleted of volatile substances. Currently, there is no evidence to demonstrate that HTPs are less harmful than conventional tobacco products. All forms of tobacco use are harmful, and HTPs should be subject to policy and regulatory measures like all other tobacco products.

DO PEOPLE KNOW THAT
TOBACCO CAN DAMAGE YOUR HEART?

While most people are aware that tobacco use increases the risk of cancer, there are gaps in knowledge of the CVD risks of tobacco use — and in many countries, these knowledge gaps are substantial *(24)*.

Findings from the Global Adult Tobacco Survey (GATS) show that the percentage of adults who do not believe that smoking causes stroke ranges from 73% in China to 11% in Egypt and Romania; for heart attacks, the figure ranges from 61% in China to 5% in Egypt *(24)* (see Fig. 2).

FIG. 2. ADULTS WHO DO NOT BELIEVE, OR DO NOT KNOW, THAT SMOKING CAUSES STROKE AND HEART ATTACKS (%)



Source: (*24*)

BENEFITS OF
QUITTING TOBACCO USE

The benefits of quitting tobacco use are substantial. WHO recommends brief advice, use of counselling (toll-free quitlines) and/or mobile text messages (mCessation) as the most effective solutions to help tobacco users to quit. In addition, for those unable to quit with these recommended approaches, there also exist effective medications such as nicotine replacement therapy, bupropion or varenicline to help tobacco users to quit.

BENEFICIAL HEALTH CHANGES THAT TAKE PLACE *(25, 26)*

Within 20 minutes
the heart rate and blood pressure drop *(27)*

Within 12 hours
the carbon monoxide level in the blood drops to normal *(28)*

2-12 weeks after quitting tobacco use
the circulation improves and lung function increases *(25)*

6 weeks after quitting smokeless tobacco use
97% of oral leukoplakic lesions are completely resolved *(29)*

1-9 months after quitting smoking
coughing and shortness of breath decrease *(25)*

1 year after quitting smoking
the risk of coronary heart disease is about half that of a smoker *(25)*

1-4 years after quitting smokeless tobacco use
the risk of death falls to nearly half that of a person who continues to use it *(30)*

5-15 years after quitting smoking
the risk of stroke is reduced to that of a non-smoker *(25)*

10 years after quitting smoking
risk of lung cancer falls to about half that of a smoker, and the risk of cancer of the mouth, throat, oesophagus, bladder, cervix and pancreas decreases *(25)*

15 years after quitting smoking
risk of coronary heart disease is that of a person who never smoked *(25)*

PEOPLE OF ALL AGES WHO HAVE ALREADY DEVELOPED HEALTH PROBLEMS RELATED TO TOBACCO USE CAN STILL BENEFIT FROM QUITTING.

Benefits in comparison with those who continue to use tobacco *(26)*

- Aged about 30: gain almost 10 years of life expectancy
- Aged about 40: gain nine years of life expectancy
- Aged about 50: gain six years of life expectancy
- Aged about 60: gain three years of life expectancy
- After the onset of life-threatening disease: rapid benefit – people who quit tobacco after a myocardial infarction reduce their chances of death by between 36% *(31)* and 46% *(30)*

BENEFITS TO **SOCIETY**

The global economic cost of smoking is estimated at more than US$ 1.4 trillion per year. This includes around US$ 400 billion in direct medical care costs and nearly US$ 1 trillion in indirect costs, representing the value of lost productivity due to premature death and morbidity from exposure to second-hand smoke *(32, 33)*. Tobacco cessation interventions are a cost-effective means of preventing CVD and save significant costs in terms of both short- and long-term medical care *(34)*. A study that investigated the economic costs of smoking estimated that the cost of helping a smoker to quit smoking (approximately US$ 1000–1500) is offset by the short-term costs of avoided heart attacks and stroke alone *(35)*.

SOLUTIONS

WHO FRAMEWORK CONVENTION **ON TOBACCO CONTROL**

The WHO Framework Convention on Tobacco Control (WHO FCTC) *(36)* provides a strong, concerted response to the global tobacco epidemic and its enormous health, social, environmental and economic costs. It obliges Parties to implement comprehensive, effective tobacco control measures. Through its 181 Parties, the WHO FCTC covers more than 90% of the world's population. The WHO FCTC combines measures to reduce both demand for and supply of tobacco products, and includes other key provisions, such as a requirement that Parties act to protect public health policies from interference by commercial and other vested interests of the tobacco industry. The treaty's scope covers the full chain of tobacco production and distribution, from farm to factory to point of sale.

FCTC
WHO FRAMEWORK CONVENTION
ON TOBACCO CONTROL

GLOBAL HEARTS INITIATIVE
Working together
to beat **cardiovascular disease**
#beatNCDs

GLOBAL **HEARTS INITIATIVE**

To support governments in strengthening the prevention and control of CVD, WHO and the United States Centers for Disease Control and Prevention launched Global Hearts, a new initiative comprising three technical packages, in September 2016 *(37)*.

On the prevention side, Global Hearts comprises the MPOWER package[1] for tobacco control, aligned with the WHO FCTC, and the SHAKE package[2] for salt reduction. On the management side, the HEARTS technical package[3] works to strengthen management of CVD in primary health care to reduce complications such as heart attacks and stroke *(37)*.

Combined, these packages provide a set of high-impact, evidence-based interventions that, when used together, will have a major impact on improving global heart health.

BEST BUYS FOR NONCOMMUNICABLE DISEASE **PREVENTION AND CONTROL**

The World Health Assembly has endorsed a set of WHO "best buys" and other recommended interventions for governments to implement for the prevention and control of noncommunicable diseases. Tobacco and CVD control feature prominently among these "best buys", as proven, cost-effective measures that can be scaled up in countries. The MPOWER measures feature prominently in the "best buys" *(38)*.

[1] **MPOWER** package: **M**-onitor tobacco use and prevention policies, **P**-rotect people from tobacco smoke, **O**-ffer help to quit tobacco use, **W**-arn about the dangers of tobacco, **E**-nforce bans on advertising, **R**-aise taxes on tobacco. This technical package is intended to assist in reducing the demand for tobacco products at country level.

[2] **SHAKE** package: **S**-urveillance, **H**-arness industry for reformulation, **A**-dopt labelling, **K**-nowledge improvement, **E**-nvironment for healthy eating. This technical package has been designed to assist Member States with the development, implementation and monitoring of salt reduction strategies in the population.

[3] **HEARTS** package: **H**-ealthy-lifestyle counselling, **E**-vidence-based treatment protocols, **A**-ccess to essential medicines and technology, **R**-isk based charts, **T**-eam-based care, **S**-ystems for monitoring. This technical package provides a strategic approach to improving cardiovascular health in countries.

OPPORTUNITIES

EVERYBODY CAN FIGHT AGAINST TOBACCO

NATIONAL GOVERNMENTS, LOCAL GOVERNMENT AND CITIES CAN:

- advocate for comprehensive tobacco control policies as outlined in the WHO FCTC;
- support the implementation and enforcement of smoke-free laws in all public places and workplaces, including offices, restaurants, bars, casinos, hospitals and clinics, to protect people from the harmful effects of second-hand smoke;
- support the implementation of pictorial health warnings on all tobacco products as a cost–effective method for informing tobacco users about the health risks of tobacco;
- promote the adoption of labels that warn about the CVD risks of tobacco according to the WHO FCTC guidelines for health warnings;
- support the implementation of policies to provide systematic access to smoking cessation advice and pharmacotherapy;
- promote the use of evidence-based mass media campaigns to raise awareness about the CVD risks of tobacco use and second-hand smoke exposure;
- educate the public and correct the misconceptions about CVD and tobacco use;
- implement and enforce policies to prevent tobacco industry lobbying and interference in tobacco control policy.

ALL HEALTH-CARE PROVIDERS, GENERAL PRACTITIONERS, DOCTORS AND CARDIOLOGISTS CAN:

- ask patients about their tobacco use and provide brief advice to quit to every tobacco user;
- model tobacco-free living by not smoking and by helping patients and health professionals who do smoke to quit;
- ensure that clear, comprehensive smoke-free policies are established and enforced in all health facilities, organizations and training facilities (including universities) and at all events (including conferences);
- advocate for tobacco-free investment of their health institute's pension fund, savings and other financial portfolios;
- implement programmes and protocols to ensure that cessation support and advice on eliminating second-hand smoke exposure are provided systematically. Non-smokers should also be advised to eliminate second-hand smoke;
- support the inclusion of tobacco cessation counselling in the medical undergraduate, graduate and postdoctoral curriculum;
- increase the visibility of tobacco control issues, including smoking and second-hand smoke exposure, at major clinical cardiology meetings and in continuing education programmes.

COMMERCIAL ESTABLISHMENTS CAN ALSO PLAY A PART:

- restaurant and bar owners should make sure that they comply with national smoke-free legislation and keep their establishments completely smoke-free;
- shop owners should adhere to existing bans on tobacco advertising and promotion and should not, for instance, distribute free samples and/or display tobacco advertising in their shops;
- sports clubs and sporting, recreational, music, social and cultural events should not accept any form of tobacco sponsorship, particularly for youth events;
- retailers should strictly comply with restrictions on sale of tobacco products to minors, bans on tobacco advertising, promotion and sponsorship, and should not, for example, distribute free samples or display tobacco advertising where this is not consistent with their domestic law.

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