

The Ten Threats to Global Health in 2018 and 2019. A welcome and informative communication of WHO to everybody

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Abstract

The paper presents lists of Ten Threats to Global Health published by the World Health Organization in 2018 and 2019. The lists give health problems and emergencies which seriously menace the health and well-being of billions of people on earth. The threats and health challenges are commented in the text. The interested reader is referred to the concise and easily legible original documents which give core data about the threats, actions and responses.

Key words: global health, health threats, World Health Organization

Słowa kluczowe: Światowa Organizacja Zdrowia, zagrożenia zdrowotne, zdrowie na świecie



Ministerstwo Nauki
i Szkolnictwa Wyższego

Przygotowanie do wydania elektronicznego finansowane w ramach umowy 637/P-DUN/2019 ze środków Ministerstwa Nauki i Szkolnictwa Wyższego przeznaczonych na działalność upowszechniającą naukę.

Introduction

At the beginning of 2018 and 2019 the World Health Organization (WHO) published a list of Ten Threats to Global Health [1, 2]. The lists give health problems and emergencies which in the coming year will demand WHO's special attention as well as that of its health partners because, from a variety of angles, they seriously menace the health and well-being of billions of people on earth. The WHO itself does not state or claim that these threats really are the most serious ones the world's growing population has to cope with, they are just some of the threats to global health that we are likely to face. WHO rather motivates and documents why and how the selected menaces to health will be

especially addressed in the coming year, even where there is underfunding of WHO's operations and where its needs continue to grow.

Nevertheless, since the WHO undisputedly is the highest global health authority and leader of the joint fight for the health and well-being of the world's population, the lists have generally been understood as identifying the "Top ten" of health threats".

Both lists and the accompanying documentation are a welcome and clear communication to all stakeholders and, most certainly, especially to the general public which should be better informed about the great menaces for the health and well-being in the own country, on the own continent and elsewhere, and about WHO's work at the front against them.

WHO List of Threats 2018	WHO List of Threats 2019
Pandemic Influenza	Airpollution and Climate Change
Health in Conflict	Noncommunicable diseases
Cholera	Global influenza pandemic
Diphtheria	Fragile and vulnerable settings
Malaria	Antimicrobial resistance
Natural Disasters	Ebola and other high-threat pathogens
Meningitis	Weak primary health care
Yellow fever	Vaccine hesitancy
Malnutrition	Dengue
Food Poisoning	HIV

Table I. *The WHO Lists of Threats 2018 and 2019.*

Source: World Health Organization (WHO), *10 Threats to Global Health in 2018* [1]; World Health Organization (WHO), *Ten Threats to Global Health in 2019* [2].

The interested reader is referred to the concise and easily legible original documents which give core data about the threats, actions and responses. For an overview the threats are given here first by title in the **Table I** and then briefly commented in the text (which for a great deal gives (Lit) the original description in the two WHO documents [1, 2], but not in the same order and with some additional data and a personal reflection on recent developments).

Pandemic influenza

Precisely one century ago the dramatic Spanish Flu killed as many as 100 million people. Epidemiologists consider a next influenza pandemic as inevitable, and characterize the present period as an “interpandemic phase”. WHO recommends worldwide vaccination against seasonal flu. More than 150 public health institutions in 110 countries work together in influenza surveillance and response. In co-operation with WHO Europe Office, the European Centre for Disease Prevention and Control ECDC monitors and reports on influenza activity on a weekly basis throughout the flu season [3].

The well-known and tricky seasonal changes among influenza strains are a perpetual challenge. Every year, WHO recommends which strains should be included in the vaccines. A universal influenza vaccine would, therefore, be a major step towards the broad and durable protection of the global population from flu. The National Institute of Health of the US (NIH) has recently reported the start of the first-in-human trial of such universal influenza vaccine candidate H1ssF_3928 [4].

Environmental threats: air pollution/climate/natural disasters

In 2019, air pollution is characterized by WHO as the greatest environmental risk to health. Every year it kills 7 million people prematurely from diseases such as cancer, stroke, heart and lung disease, mainly in low-income countries with large emissions from industry,

transport and agriculture as well as dirty cookstoves and fuels in homes. Burning fossil fuels is also a major contributor to climate change which after 2030 might cause every year 250 000 additional deaths from malnutrition, malaria, diarrhoea and heat stress.

Natural disasters like floods, hurricanes, earthquakes and landslides can cause immense suffering and have health consequences for millions of people. Droughts which lead to food insecurity and malnutrition are often associated with disease outbreaks; heatwaves cause excess mortality, particularly among the elderly.

The growing impact of environmental changes on the occurrence or resurgence of diseases with the potential to cause public health emergencies was also discussed in the special WHO expert group R&D Blueprint list of priority diseases. This will certainly be taken into account in future reviews of the Blueprint list [5].

Cholera

Every year cholera kills 100,000 people in communities suffering from poverty, regional conflicts or natural disasters. In 2017, oral vaccines were used to protect 4.4 million people in Bangladesh, Cameroon, Haiti, Malawi, Mozambique, Nigeria, Sierra Leone, Somalia and South Sudan. WHO supports the campaigns and access to safe water, sanitation and improved hygiene.

WHO initiated a Global Task Force on Cholera Control (GTFCC) which supports countries to reduce cholera deaths by 90 percent. With the commitment of cholera-affected countries, technical partners and donors, as many as 20 countries might eliminate disease transmission by 2030 [6].

From the beginning of March to mid-March of 2019 the cyclone Idai hit Malawi, Mozambique and Zimbabwe, causing several hundred casualties, serious floods, hundreds of thousands of displaced people and an upsurge of infectious diseases outbreak such as cholera. F.i. in a single week (24–30 March) WHO reported 500 fatalities, 140,000 displaced persons and more than 2000 new cases of cholera in Mozambique; a vaccination campaign was started in the affected areas [3, 7].

Malaria

More than 200 million cases of malaria are estimated to occur annually worldwide, causing over 400 000 deaths. By far most of them occur in sub-Saharan Africa, the rest in South-East Asia, South America, the Western Pacific and Eastern Mediterranean. In certain African areas like Central African Republic and South Sudan malaria kills more people than war. Democratic Republic of the Congo, Nigeria and Somalia also suffer seriously from this disease.

In February 2019 WHO has published for the first time a comprehensive set of evidence-based *Guidelines for Malaria vector Control*, providing a “one-stop shop” for countries and partners working to implement effective control interventions. The guidelines cover the two core malaria vector control tools – insecticide-treated nets

and indoor residual spraying – as well as supplementary interventions and personal protection measures [8].

On World Malaria Day 2019 (25 April) WHO joined the global RBM Partnership to End Malaria, the African Union Commission and other partner organizations in promoting “Zero malaria starts with me”, a grassroots campaign that aims to keep malaria high on the political agenda, mobilize additional resources, and empower communities to take ownership of malaria prevention and care [9].

Health in conflict/fragile and vulnerable settings

More than 1.6 billion people live in places where protracted crises and weak health services leave them without access to basic care (often as a result of a combination of challenges such as drought, famine, conflict, and population displacement). In many conflict places more people die of treatable and preventable diseases and chronic illness, than of bullets and bombs. WHO will continue to work in these countries to strengthen health systems so that they are better prepared to detect and respond to outbreaks, as well as able to deliver high quality health services, including immunization.

Ebola and other high-threat pathogens

In 2018 and 2019, the Democratic Republic of the Congo saw 2 separate outbreaks of the high threat Ebola virus; both outbreaks spread from rural areas to densely populated cities of more than 1 million people. One of the affected areas is in an active conflict zone. “The Ebola outbreak in the Democratic Republic of Congo does not constitute a public health emergency of international concern”, according to a statement issued on Friday 12 April by the WHO [10].

In December 2018 the participants of a conference on Preparedness for Public Health Emergencies called for WHO and partners to designate 2019 as the “Year of action on preparedness for health emergencies”. Ebola, Zika, Nipah, MERS-CoV and SARS and other haemorrhagic fever viruses are on WHO’s Blueprint priority list of pathogens which have a potency to cause public health emergencies but lack effective treatments and vaccines, and requiring accelerated research and development (see also under Environmental Threats). The list also includes “Disease X” representing the awareness that a previously unknown pathogen could cause a major public health emergency with pandemic potential that might kill millions, but for which there are currently no, or insufficient, countermeasures available.

Though they also pose major public health problems with urgent R&D needs, several of the diseases mentioned in WHO’s 2018 and 2019 threat lists such as yellow fever, dengue, HIV/AIDS, malaria, influenza were considered outside the scope of the Blueprint R&D priority list, f.i. because of existing other disease controlling initiatives or R&D funding pipelines [5].

Yellow fever

The early years of this century have shown a frightening comeback of the acute viral hemorrhagic disease Yellow fever. Its changing epidemiology, the resurgence of mosquitoes and the risk of international spread pose an emerging global threat that requires new strategic thinking. Therefore, WHO initiated a long-term (2017–2026) and global strategy to eliminate yellow fever Epidemics (EYE strategy). In all, 27 countries in Africa and 13 in the Americas are considered to be at highest risk and need large-scale, preventive vaccination strategies to establish and maintain high levels of immunity among their populations. In 2016 successful mass vaccinations of 30 million people could limit the disease in the Democratic Republic of the Congo; two years later major outbreaks in urban areas in Nigeria and Brazil have been tackled.

Vaccine manufacturers are expected to be able to meet the global demand of 1.38 billion doses needed to end YF outbreaks. This will require pushing their production to the maximum possible levels [11].

Diphtheria

In most parts of the world diphtheria has been successfully eliminated by routine immunization. However the disease is making a comeback in countries with insufficient healthcare provision. F.i., in the foregoing years Venezuela, Indonesia, Yemen and Bangladesh have been confronted with diphtheria outbreaks which needed WHO support for response operations, supply of medication and diphtheria vaccines.

Dengue

This arthropod-borne disease with flu-like symptoms is killing up to 20% of the severely affected. Dengue is a growing threat which in the last five decades has shown an almost 30-fold incidence. It mainly occurs during rain season in tropical countries like India, Pakistan and Bangladesh. Last year, the latter country saw the highest number of infections and fatalities in almost two decades.

Worldwide almost 400 million infections occur annually. At present, the disease seems to spread to less tropical countries which traditionally were free from it. WHO estimates that 40% of the world is at risk. A safe, effective and affordable dengue vaccine against the four major dengue strains would represent a great advance for the control of the disease and could be an important tool for reaching the WHO target of reducing dengue morbidity by at least 25% and mortality by at least 50% by 2020. Phase 3 trials with the first licensed dengue vaccine Dengvaxia® (CYD-TDV, Mexico) showed that an overall population level benefit of vaccination remains favorable, but the vaccine performs differently in seropositive versus seronegative individuals [12].

Meningitis

Meningitis is a devastating disease and remains a major public health challenge. It can be caused by many different pathogens including viruses and fungi but the highest global burden is seen with bacterial meningitis. Meningococcal meningitis C is circulating along Africa's meningitis belt, threatening 26 countries. The risk of large-scale epidemics is dangerously high and more than 34 million people could be affected. Together with sepsis, meningitis is estimated to cause more deaths in children under 5 years of age than malaria. Survivors can suffer severe sequelae with considerable social and economic costs. Recognizing the global importance of the problem, countries and partners issued calls for a global vision and the ambition to develop a global strategy to defeat meningitis by 2030 aiming at eliminating meningitis epidemics, reduce cases and deaths from vaccine-preventable meningitis by 80% and provide high quality care for survivors with sequelae. Under the lead of WHO, experts reviewed an analysis of the baseline meningitis global situation, formulated strategic objectives and developed a global roadmap which covers all the organisms responsible for the majority of acute bacterial meningitis, namely *Neisseria meningitidis*, *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Streptococcus agalactiae* (commonly referred to as Group B *Streptococcus* (GBS) [13].

HIV/AIDS

Nearly a million people every year die of HIV/AIDS. Though progress made against HIV has been enormous in terms of getting people tested and providing them with antiretrovirals and preventive measures such as pre-exposure prophylaxis (PrEP), the epidemic continues to rage. Since its beginning, worldwide more than 70 million people have been infected, of whom 35 million have died.

Reaching people like sex workers, people in prison, men who have sex with men, or transgender people is hugely challenging. Young girls and women (aged 15–24) are particularly at high risk and account for 1 in 4 HIV infected in sub-Saharan Africa. WHO will work with countries to support self-testing so that more people with HIV know their status and can receive treatment or preventive measures in case of negative test. One activity of WHO and the International Labour Organization (ILO) is to support companies and organizations to offer HIV self-tests in the workplace [14].

Noncommunicable diseases

Diabetes, cancer and heart disease are responsible for 70% of all deaths worldwide, of which 40% people dying prematurely, aged between 30 and 69 and mainly living in low- and middle income countries. Five major risk factors have been identified: tobacco use, physical inactivity, alcohol abuse, unhealthy diets and air pollution.

These factors also influence mental health issues, that may originate at early age: half of all mental illness has its origin at the age of 14 but often goes undetected and thus untreated. Suicide is the second leading cause of death among 15–19 year-olds.

WHO will co-operate and help countries meet the global target of reducing physical inactivity by 15% by 2030. ACTIVE, a technical package for increasing physical activity is a policy toolkit to help adults, children and older adults being active every [15].

Weak primary health care

Primary health care usually is someone's first point of contact with the health care system and ideally should provide comprehensive, affordable, community-based care throughout life. Many countries, often low or middle-income countries do not have adequate primary health care facilities. In October 2018 WHO co-hosted a major global conference in Astana, Kazakhstan at which all countries committed to renew the commitment to primary health care made in the Alma-Ata declaration in 1978. WHO will work with partners to revitalize and strengthen primary health care in the countries, and in doing so follow up on the commitments in the Astana declaration [16]. In addition, WHO's key message on World Health Day (April 7, 2019) underlined the importance of realizing a Universal Health Coverage: all people can use quality health services where and when they need them, without financial hardship. Primary health care should be the first level of contact with the health system, where individuals, families and communities receive most of their health care – from promotion and prevention to treatment, rehabilitation and palliative care – as close as possible to where they live and work [17].

Malnutrition and food poisoning

The availability of sufficient, good and safe food is primordial for health and well-being of all living creatures. This prerequisite is by far not met everywhere on earth. In 2016, a joint study of The World Bank and UNICEF concluded that nearly 385 million children are living in extreme poverty [18]. Globally, 45% of deaths among children under 5 are linked to underfeeding. Shortages of food will remain great challenges, especially in the Horn of Africa. Nearly half of the population of South Sudan faces severe food insecurity. In Yemen, 7 million people are at risk of malnutrition and 17 million remain food insecure.

Every year 1 in 10 people in the world fall ill and 420.000 die after eating contaminated food. Last year, South Africa had to battle world's largest listeriosis outbreak on record. On 6 December 2017, France reported an outbreak of *Salmonella* serotype Agona in infants <1 years of age which on epidemiological data could be linked to the consumption of infant milk formula. A broad recall of this formula and related infant products, an export ban and suspension of placing them on the market, have been implemented since the beginning of December 2017 [19].

Antimicrobial resistance

Without doubt antibiotics, antivirals and antimalarials are some of modern medicine's greatest successes. However, in the past decades the unprudent and misuse of these 'miracles' in the medical, veterinary and agricultural sectors has led to a growing resistance of bacteria, parasites, viruses and fungi against these drugs. Antimicrobial resistance threatens to send us back to a time when we were unable to easily treat infections such as pneumonia, tuberculosis, gonorrhoea, salmonellosis etc. F.i., tuberculosis is a disease that annually causes 10 million people to fall ill, and 1.6 million to die. In 2017 around 600 000 cases of TB were resistant to rifampicin, the most effective first-line drug, and over 80% of these people had multidrug-resistant TB.

The inability to prevent and treat resistant infections could seriously compromise surgery and procedures such as chemotherapy. "The danger posed by the growing resistance to antibiotics should be ranked along with terrorism on a list of threats to the nation", the government's chief medical officer for England once stated [20]. On October 5, 2016 the General Assembly of the United Nations adopted a political declaration aimed at combating the global threats posed by antimicrobial resistance, which could include significant development backslides and millions of deaths each year if unaddressed [21]. In line with this declaration WHO, ECDC, OECD, G20 member states and many other partners are cooperating worldwide to implement the global action plan against antimicrobial resistance. Since 2008 the 18th of November has been chosen as the annual Antibiotic Awareness Day in the European Union, which since 2015 is falling in WHO's World Antibiotic Awareness Week. Both campaigns aim to raise awareness of proper use of antibiotics and the threat of antibiotic resistance.

Vaccine hesitancy

Vaccination is one of the most cost-effective ways of avoiding disease and currently prevents 2–3 million deaths a year. Vaccination hesitancy, the reluctance or refusal of vaccine despite availability of vaccination services, seriously threatens progress made in tackling vaccine-preventable diseases. A recent example is measles, which have seen a 30% increase in cases globally. At present, there are serious outbreaks of measles in the US (State of New York), Germany, Italy, Poland and other countries. A vaccination rate in a population below 95% is believed to lead to insufficient "herd protection" and a great risk of the disease's rapid spread. April 2019 more and more national and regional authorities in the outbreak areas are rapidly taking or preparing legal countermeasures such as mandatory immunizations, or a forbid for unvaccinated children and students to visit kindergartens, schools or public places.

Another example is the occurrence of cervical cancer which might well be reduced or even eliminated by HPV vaccination, but the campaigns often meet criticism and vaccine hesitancy. Misinformation about risks

and adverse effects of HPV vaccination, is especially disseminated via internet, which seriously feeds mistrust amongst parents about vaccination safety.

As to poliovaccination: 2019 might become the year when transmission of wild poliovirus is stopped in Afghanistan and Pakistan. However, in these conflict zones untries vaccination is made very difficult by the leaders of war and terror. In 2015 already over 70 polio vaccination workers have been killed in Pakistan, the murders being claimed by the Taliban [22].

The reasons why people choose not to vaccinate are complex: complacency, inconvenience in accessing vaccines, lack of confidence or religious rules are key reasons [23, 24]. More recently, the Vaccination Confidence Project funded also by the WHO, the CDC, the ECDC and the Bill Gates Foundation also studied the vaccination confidence in the member states of the European Union [25]. Some key findings: the age groups under 65 have less confidence in the safety and importance of both the MMR and seasonal influenza vaccines (and vaccines generally) than over 65's. A number of member states – including France, Greece, Italy, and Slovenia – have become more confident in the safety of vaccines since 2015; while Czech Republic, Finland, Poland, and Sweden have become less confident over the same period. GPs generally hold higher levels of vaccine confidence than the public, but the survey found that 36% of GPs surveyed in Czech Republic and 25% in Slovakia do not agree that the MMR vaccine is safe and 29% and 19% (respectively) do not believe it is important. The majority of GPs in these countries report that they are not likely to recommend the seasonal influenza vaccine, yet Czech Republic, Poland, and Slovakia all report to the WHO that they recommend the seasonal influenza vaccine to pregnant women (WHO, Immunization Schedule by Antigens, 2018).

Another finding was the correlation between GP confidence and that of the general public: countries whose GPs hold higher confidence in vaccines tend to have a larger proportion of the public expressing positive vaccination beliefs. This once again emphasizes the role of the GP in important health discussions. The report also provides rankings of member states by overall level of confidence in the safety of vaccines and provides raw data summaries for each member state.

Conclusions and comments

Almost every day the general public can read in its own regional paper and national or international public media about serious diseases and outbreaks nearby or somewhere else in the world. In many cases, the World Health Organisation and the International Red Cross are mentioned as leading parties for help and protection of the population on site. However, health literacy of the general public, and sometimes also that of the well-educated or (semi)professionals, is often insufficient to correctly understand the specific aspects of the emergencies. The relevance of WHO's knowledge, expertise and operations to protect the people on the spot and to prevent the spread of the disease is too often simply

taken for granted. Therefore, the publication of the Ten Threats to Global Health in 2018 and 2019, respectively, is a welcome tool for good and basic informing all stakeholders – from the general public to students, journalists and policymakers – about the most serious threats to health and well-being which accompany our live and traveling in the modern, mobile but overstressed world. Hopefully, this information will also sensitize us for the growing needs of WHO and its partner organisations which must fulfill their protective tasks adequately.

Some further remarks about the lists for 2018 and 2019:

- As in the centuries before, infectious diseases remain to be the major global health threats to man; however, more and more geo-political, man-made or man-driven factors such as airpollution, climate change, poverty and health-organisational factors become important.
- For the majority of the threats on the lists the WHO has developed dedicated programs and roadmaps, usually in cooperation with relevant partners and with ambitious goals of reducing the burden or total elimination at a defined date. The clear, short and easily understandable titles of these programs are well chosen, will certainly appeal people and politics and lead to better understanding.
- At the time being the two most effective (and efficient) instruments to prevent and treat high-pathogen infections, namely vaccination and antibiotics, are seriously at hazard; vaccination is undispendible in the fight against most of the diseases mentioned, and without antimicrobials good medicine is almost unthinkable; therefore, global and co-ordinated measures and co-operation are highly necessary to keep these medical miracles available to mankind.
- Our modern world shows great contrasts in living conditions, many violent ethnic, religious and military conflicts, massive migration, intercultural integration problems, an unprecedented digitalisation, acceleration and stresses in our lives, etc. etc; the resulting mental burden and challenges thresspass many citizens' capacity, be it children, adults or the elderly. Mental diseases will rapidly deserve a very prominent own place on a next WHO list, if we really want to prevent or master the threat of a future psychic tsunami.

Finally, unnecessary to state that the ambitions, the programmes and activities of the WHO mentioned in the lists of threats for global health 2018 and 2019 also fit well within WHO's 5-year strategic plan with its ambitious "Triple billion target": ensuring 1 billion more people benefit from universal health coverage, 1 billion more are protected from health emergencies and 1 billion improve their overall health. This under the overarching motto "Promote health, keep the world safe, serve the vulnerable" [26].

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