

## Biosecurity and Non-Communicable Diseases

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### Abstract

Although the traditional biosecurity paradigm is concerned with the deliberate misuse of biological agents, in recent years national security strategies have widened in scope to address a much wider spectrum of biological threats. This expanding remit, partly spurred by the high-profile epidemics of the early 2000s, still does not include conditions that have been traditionally conceived as non-infectious. Non-communicable diseases (NCDs), including cardiovascular disease, diabetes, cancers, and chronic respiratory diseases, are together responsible for 70 per cent of deaths worldwide. Heart disease and cancer have long been the leading causes of death in high-income countries but the increasing availability of tobacco, alcohol, processed food and western lifestyles have led to a boom in deaths from NCDs in low-income settings over recent decades. The substantial socio-economic burden levied by NCDs can undermine political stability in fragile states by straining weak health systems and exacerbating social inequalities. This review article argues that the rise of NCDs is a threat to international security, and that departments of defence have a central role to play in the prevention and control of these diseases. NCDs compromise the integrity of standing armies, incur large military opportunity costs, threaten the health of domestic populations, restrict economic growth in the developing world, stoke socioeconomic inequalities and seed social unrest in fragile states. Greater defence spending on domestic and international efforts to promote health and manage NCDs should be a core function of defence departments mandated to promote global security.

**Keywords:** Non-communicable diseases; Biosecurity; Global health; Defence strategy

### Introduction

Although disease has always been a serious threat to international security, it cannot be combatted with sabres or rifles and generals have historically assumed that the prevention and control of illness lies beyond the ambit of national defence [1,2]. The practice of artificially dividing health and security and managing them in separate silos has been challenged by the unfolding process of globalization. Pandemics such as severe acute respiratory syndrome (SARS) and swine flu (H1N1) have catalysed the evolution of the modern concept of international security that extends beyond military preparedness to mitigating and managing non-traditional threats including climate change, terrorism, migration, and political volatility [3]. Although infectious diseases are now firmly established as a core concern for defence ministers and subject to comprehensive biosecurity strategies, non-communicable diseases represent a far greater threat to international security, yet they remain on the outskirts of the security agenda [4].

### Non-communicable Diseases

In the pre-industrial era infectious diseases, violence and famine were the leading causes of death and disability worldwide [5]. As nations modernised, public health and sanitation measures achieved huge reductions in mortality from diarrhoea, tuberculosis, pneumonia and plague [6,7]. The nature of conflict has also changed significantly over the past few centuries. Violence and murder rates have plummeted over the last 500 years and today 95 per cent of all armed conflict takes place within – as opposed to between – states [8,9]. Early

death from violence, starvation and infection has been largely superseded by degenerative and ‘man-made’ conditions; driven by overconsumption of alcohol, unhealthy food, tobacco, and insufficient physical activity. These so-called non-communicable diseases (NCDs) include heart disease, cancers, diabetes, mental illness and chronic obstructive pulmonary disease [10,11]. These conditions currently account for 69% of global deaths (including 16 million premature deaths every year) and this proportion is growing [12].

Many developing countries are experiencing a ‘double burden of disease’ with malnourished citizens and weak health systems on one hand and the increasing affordability, accessibility and cultural desirability of western lifestyles leading to an NCD boom on the other [13]. Although NCDs have been portrayed as ‘diseases of affluence’, people living in developing countries are 1.5 times more likely to die from an NCD before their 70th birthday compared with individuals living in high income countries [14]. Although cardiovascular disease and cancers remain the leading cause of death in high-income countries, there have been large reductions in age-standardised death rates over recent decades [15]. At the same time industrial and demographic transitions in the developing world have seen non-communicable diseases account for an increasing share of total deaths [16]. Globalization is a major driver of the increasing availability of unhealthy products and lifestyles in low-income and fragile states [17]. Globally NCDs levy vast economic costs – an estimated \$47 trillion in lost output to the world economy by 2030 [18]. They also exacerbate socioeconomic inequalities and seed social unrest.

### A Convergence of Concerns

Although health and defence have traditionally occupied separate domains, in recent years the significant overlaps between health and

national security have been recognised by policymakers in both spheres. Many medical innovations and technologies currently used in emergency rooms and operating theatres have military origins. Breakthroughs in surgery, trauma care, circulatory access, prosthetics and rehabilitation have come from the field of battle or military R&D. Contemporary examples of these partnerships abound, for instance shared interest in organ preservation has led the Department of Defence (DoD) to seed fund seven different medical research groups in the USA [19].

The negative side of the relationship between conflict and health is self-evident. Conflict kills and maims, it destroys public health infrastructure, disrupts medical supply chains, frustrates basic sanitation measures, kills healthcare workers, and prompts mass migration. These circumstances lead to mental illness, an inability to treat other non-communicable diseases, and the flourishing of infectious diseases [20].

Globalization has exposed all countries to threats such as SARS, Ebola and Zika virus. The growing recognition that these epidemics undermine national security is slowly being extended to transnational non-infectious vectors of disease including sugary drinks, tobacco and processed foods.

## NCDs and Biosecurity

Biosecurity is the established nexus of health and defence but the current definition does not encompass the true extent of the overlap. Stemming from agriculture, biosecurity evolved as measures to protect crops and livestock from infectious disease [21,22]. Galvanised by biological terrorist attacks at the turn of the millennium [23,24], the term was co-opted by national defence departments and applied to populations at risk from bioterrorism [25].

The 2000s represents somewhat of a watershed as the remit of national defence was broadened to encompass public health in the USA [26]. A seminal US National Intelligence Council report acknowledged that diseases endanger citizens at home and abroad, threaten military personnel, and exacerbate social and political instability in regions where the USA has strategic interests [27].

Following SARS and H1N1 the UN High-Level Panel on Threats called for an emphasis on countering biological security challenges [28]. The 2006 US National Security Strategy classified pandemics at the same level of threat as terrorist acquisition of nuclear weapons [29]. In 2014 the UN Security Council passed its third health-related resolution declaring Ebola a “threat to international peace and security” [30]. The Obama administration’s 2009 National Strategy for Countering Biological Threats significantly widened the scope of biodefense from countering misuse of biological agents to addressing the full spectrum of biological threats to humans, plants, animals and critical resources.

## NCDs as a Threat to International Security

The global rise of obesity, diabetes, premature strokes, heart attacks, cancers, and chronic respiratory diseases directly threatens international security. Non-communicable diseases compromise the integrity of standing armies, feed inequalities and social unrest in fragile states, and threaten the health of domestic populations.

Former US Army general JE Wilson has cited child obesity as a “threat to national security” as a quarter of young adults are unable to serve in the military due to excess body fat [31,32]. This issue is not

confined to the USA. Forty per cent of German soldiers are overweight and 8.5 per cent are ‘seriously overweight’ - uncomfortable figures that constitute a significant disadvantage on the battlefield, by the German MoD’s own admission [33]. The US military health insurance system (TRICARE) spends over \$1 billion a year treating weight-related NCDs including diabetes and heart disease [34]. An obesity-related medical expense for soldiers on limited duty costs an additional \$5,000 million per year [35]. These expenses represent significant opportunity costs for defence departments as the resources could be used elsewhere.

A Council on Foreign Relations (CFR) task force on NCDs in low- and middle-income countries (LMICs) warned that the impact of NCDs on the working-age poor is undermining Western interests in these settings [36]. The epidemic is estimated to cost these nations \$21.3 trillion in lost output over the next 20 years; significantly constraining the economies of strategic trade partners [37]. Western exports like processed foods and alcohol products are partly to blame for the rising prevalence of NCDs in developing countries, and anger at continued ‘Coca-Colonisation’ can ferment social unrest and aid radicalisation. NCDs exacerbate socioeconomic disparities, disproportionately afflicting the most disadvantaged and trapping families in poverty through medical bankruptcy and lost employment. Inequitable social conditions contribute to political volatility which is an increasingly important foreign policy concern. Unsurprisingly the CFR report concludes that in order to secure Western interests in developing countries, addressing NCDs should be considered a strategic priority.

Unprecedented levels of migration from Syria, Afghanistan and North Africa has prompted many European leaders to emphasise the importance of investing in prevention of political instability: British premier David Cameron recently outlined a £100 million package to rebuild fragile states bordering Syria and has overseen a realignment of the national development strategy to “tackle the causes of instability, insecurity and conflict” [38,39]. Combatting NCDs through investment in health systems and supporting prevention programmes is a core plank in reducing political and social volatility in fragile states.

Finally, NCDs threaten security by directly harming domestic citizens. These conditions kill millions more than armed conflict and terrorism combined, and increasingly strike at younger ages [40,41].

## NCDs as Communicable Diseases

Biosecurity is almost exclusively concerned with infectious diseases. Although the current conceptualisation will inevitably broaden, the notion that NCDs are non-infectious is also being challenged. The dominant NCD narrative has been that these conditions are caused by behaviour; namely greed and laziness. In recent years it has become apparent that the environment and social meta-trends are also instrumental. Poverty, urbanisation, population ageing, globalization and the increasing marketing, affordability and availability of unhealthy products are the most significant drivers of the epidemic [42]. Many NCDs can be passed from person to person, either through viral transmission as in the case of liver and cervical cancer [43,44] or as emerging research demonstrates - through social networks, the built environment, social and economic conditions, and intergenerational transmission [45-49]. It would seem that the term ‘non-communicable’ is a complete misnomer. More importantly, NCDs behave in a similar way to the classical infectious threats that the field of biosecurity concerns itself with.

It is also worth mentioning that combating NCDs requires comprehensive, coordinated, and multi-sectoral action. Agricultural policy, housing, education, transport, zoning laws, social security and access to health services all determine the distribution of NCD risk factors in a society. A comprehensive prevention and control strategy transcends all policy silos, not just health and defence.

NCDs are a major contemporary threat to international security. They seed unrest in volatile states, take the lives of billions around the globe, restrict economic growth, and are slowly neutering armies at home and overseas. For historic reasons the current biosecurity paradigm does not afford NCDs the status they are due. Retired US military leaders and the US Assistant Secretary of Defence for Health Affairs have called attention to the “national security problem” of NCDs [31-50]. More needs to be done.

### Military Exercise

Just as the concept of international development has evolved and broadened in scope, the international security community needs to acknowledge and manage the significant security implications of the NCD boom. The most obvious ‘upstream’ way to accomplish this is earmarking defence funding for the prevention and control of NCDs at home and in fragile states. A separate budgetary line for NCD prevention and control directly supports the aim of securing international peace.

Defence departments also need to acknowledge their role in ensuring that the general population is fit and healthy. There are signs that the US military is already awakening to this responsibility: retired US generals have been using their influence to lobby the federal government to improve the nutritional quality of school meals [51] and in some states US marines have been leading exercise classes for children [31]. Defence departments are well resourced to teach fitness and should invest more in supporting healthy lifestyles at the population level. These activities should be viewed as investments rather than costs because a healthier population not only benefits military recruiters, but increases commercial productivity, boosting general taxation revenues and defence spending where this is a set proportion of gross domestic product (e.g. 2% for NATO member states) [52,53].

Technical and budgeted financial support for health systems in LMICs is a strategic investment for those tasked with securing international peace. Military departments should partner with development and health departments, utilising the unique skills and resources of each agency. High-level commitments towards tackling NCDs as a core security issue would expedite these advancements.

Lastly, and perhaps most fundamentally, the biosecurity paradigm must evolve to accommodate NCDs. The threat posed to international security prohibits the continued, unthinking eschewal of these conditions from the biosecurity agenda.

### Disclaimer

The author alone is responsible for the views expressed in this article. This article does not represent the official position of the World Health Organization.

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