

Armed Conflict *and* *Public Health*

A report on knowledge
and knowledge gaps



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World Health Organisation Collaborating
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The Centre for Research on the Epidemiology of Disasters (CRED), is based at the Catholic University of Louvain (UCL), Brussels. CRED promotes research, training and information dissemination on international disasters, with a special focus on public health, epidemiology and social economic aspects. It aims to enhance the effectiveness of developing countries response to, and management of, disasters. CRED has formal collaborations with the United Nations Office for the Co-ordination of Humanitarian Affairs (OCHA), the International Federation of Red Cross and Red Crescent Societies (IFRC). It has also received support from the Belgian government and has formed a partnership with the European Community Humanitarian Office (ECHO). It works closely with non-governmental agencies and universities throughout most parts of the world.

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"Others, clinging, as they think, simply to a principle of justice (for law and custom are a sort of justice), assume that slavery in accordance with the custom of war is justified by law, but at the same moment they deny this. For what if the cause of the war be unjust ?"

Aristoteles, politics, book 1, part 6

Table of Contents

Preface	7
Acknowledgements	8
Executive Summary	9
Introduction	11
1. How does armed conflict adversely affect a health situation ?	
Introduction	13
Literature review	13
Flowchart	14
Discussion	21
Conclusion	21
2. How do adverse health conditions affect conflict and security ?	
Introduction	24
Literature review	24
Flowchart	26
Discussion	34
Conclusion	34
3. How can health services play a role in reducing conflict ?	
Introduction	37
Literature review	37
Flowchart	38
Discussion	43
Conclusion	43
Conclusion	44
References of Figures	46
Annex	47

Preface

This report explores the interfaces between health, armed conflict and global security by looking for answers to the following three questions. How does violent conflict adversely affect the health of people living through it ? How do adverse health conditions affect conflict/security? And how can the delivery of health services play a role in reducing conflict? This report has reviewed the different ways public health, armed conflict and global security interact through a desk study of published and unpublished works of specialised institutions. As expected, the above subjects cover a vast area of research including peace and conflict studies, security studies, negotiation and diplomacy studies, refugee and emergency issues, economics, medicine. Information has been collected from academic, governmental and non-governmental organisations through interviews, documents and published materials but it does not document all research. Some key pieces of work may have been overlooked. We limited our search to an arbitrary time limit and as a result, interesting work that could have been encountered after this period is not included. None the less, this review picks out the main trends in findings.

This review pulls together the main ideas but conceptual clarifications and international policy options still need to be worked out.

CRED has previously undertaken research on the impact of armed conflict on the health situation of children, with special attention to malnutrition, mental damage and infectious disease. For this purpose, data on mortality rates of children and adults, in conflict and non-conflict situations has been collected in order to determine the relative vulnerability of children in armed conflict when compared to adults. A full review of research groups undertaking work on the three sub-themes of this report has also been done.

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Executive *Summary*

Armed conflict and public health interact in many different ways. While it seems stating the obvious to say that conflict is bad for health, it is nonetheless important to examine precisely the various components of the interaction. It is only by this knowledge that effective interventions can be designed.

The direct impact of conflict on people includes those who are killed, injured, disabled, abused or traumatised due to armed conflict. Bombing, shelling and other violence damage agriculture, healthcare buildings and infrastructure. This leads to food shortage and breakdown of healthcare and sanitation services, in turn increasing starvation, malnutrition and incidence of infectious disease.

Much research has been conducted on these consequences, especially in refugee camps. Little is known about the impact of armed conflict on residential and internally displaced populations. Other research will have to focus on effectiveness of immediate assistance during the acute phases of emergency situations. The increase of infectious disease incidence, which is attributed to several factors such as changes in human behaviour, environment and microbes, is perceived as a threat to international security. Infectious diseases claim victims in developing countries, which may lead to political and military instability, state failure and ultimately damage to the economy.

There is a need for empirical and quantitative research to prove causal relationships between infectious disease and the threats to international security. Indicators also have to be developed in order to evaluate these relationships. In order to monitor these outbreaks, a global surveillance system has been proposed. But the absence of strong political commitment to higher quality research is slowing down the process. The position of medical professionals in society (e.g. neutrality, credibility, and equality.) is an advantage during negotiations as are health-related cease-fires. The fact that health issues are of interest to all parties contributes to this advantage.

This report has reviewed the different ways public health, armed conflict and global security interact through a desk study of published and unpublished works of specialised institutions. As was expected, the above subjects cover a vast area of research and practice. Institutions of various disciplines as well as large numbers of UN, governmental and non-governmental institutions are working in the different fields related to public health, armed conflict and global security.

As a consequence, our review does not document all research and practice that has been done and some key pieces of work may have been overlooked. Our data collection stopped at an artificial time limit and as a result, interesting work that could have been encountered after this period is not included. Non the less, this review picks out the main trends in findings.

Literature or groups undertaking work in specific sub-areas are cited with full contact references. An important conclusion could be noted is that certain sub thematic areas receive disproportionate research attention while others, although acknowledged, are neglected. Also systematic and conclusive research is rare both by epidemiologists/public health or political science/international relations researchers; although the latter seem to have published more and display a more sustained interest in the subject matter.

Infectious disease, especially in zones where surveillance and control mechanisms have broken down should be a major concern to the international community. The potential of the complex interactions of AIDS and social disruption is getting increasing recognition. This review pulls together the main ideas but conceptual clarifications and international policy options still need to be worked out.

There are several highly reputed groups involved in examining some of the areas outlined in this report. However, most of the evidence base is weak. Clarification both conceptual and empirical is required to understand how political processes in nation building interact with public welfare sectors at community levels. On the other hand, the costs of civil conflict in setbacks to health progress and disease eradication and control are also relatively unknown.

A research framework that sets out the parameters for a concrete and closer collaboration between political scientists, sociologists, international lawyers, epidemiologists and public health specialists would lead to more rational and effective international and national policy.

Intro *duction*

Health, armed conflict and global security have been closely linked for centuries. As long as armed conflict has existed, it has affected health of civilians. In ancient warfare, it was common strategy to isolate a city, to force its surrender through artificial famine.

Similarly, biological weapons in the form of animals or humans infected with a disease such as the plague were introduced into an enemy population to spread the disease. On the other hand, medical professionals have since time immemorial been involved in conflict reduction by taking on the role of good will ambassadors on behalf of ancient kings, e.g. the Arab doctors who mediated between Saladin and his Frankish opponents during the Crusades.[§]

As infectious diseases are as old as humanity itself, the medical profession has always been fighting and studying it. Disease has been associated to human displacements and protection of populations against it date from the early civilisations. In ancient Greece, Diodorus concluded that the plague was brought in by people from all over the world crowding in Athens. In Florence, authorities established Health Magistrates, who were responsible for monitoring pesthouses and for quarantining guards in order to protect society from infectious diseases.^{*†} Disease and war have been together in the past are together, today. But surprisingly, the study of its links and mechanisms remain relatively unexplored

Today, society has changed in a way that has lead to the divergence of the study of health, armed conflict and global security. Various intersections between these subjects are discussed in this report by looking for answers to three questions: How does conflict adversely affect the health of people living in zones of violent conflict? How do adverse health conditions affect conflict / security? And how can the delivery of health services play a role in reducing conflict?

Each question will be discussed in a separate chapter. A literature review and summary of views on the question will be presented. A general overview of the different causes and consequences is provided by flowcharts. Within the flowcharts, there will be references to the institutions who are involved in the issues mentioned in the flowchart. The institutions are listed in the Annex. Large institutions such as the WHO and the UN departments have not been mentioned as the selection has been restricted to academic and other non governmental institutions.

§ Cahill KM, editor. The untapped resource: medicine and diplomacy. New York: Orbis Books; 1971.

* Roizman B, editor. Infectious diseases in an age of change: the impact of human ecology and behaviour on disease transmission. Washington D.C.: National Academy Press; 1995.

† Diodorus Siculus. Historical Library. Book 12; chapter 45, section 2

All views described in this report are drawn from work of one or more groups and are cited. While some may seem more credible than others, most work in this area have been included in this document to provide as exhaustive as possible review.

The report simply presents current thinking and does not reflect the views of the authors.

How does armed conflict affect the health of people living in zones of violent conflict ?

Introduction

That armed conflict affects the health of a population seems obvious. However, when the phenomenon ceases to be an occasional event affecting a country, the picture is different. In such circumstances, it becomes necessary to desegregate and examine the ways in which long-lasting (civil) war affects the health of communities in order to protect the civilian populations from its short and long term effects. This chapter provides a summarised overview of the main channels by which the health and survival of individuals and communities are affected by armed conflict.

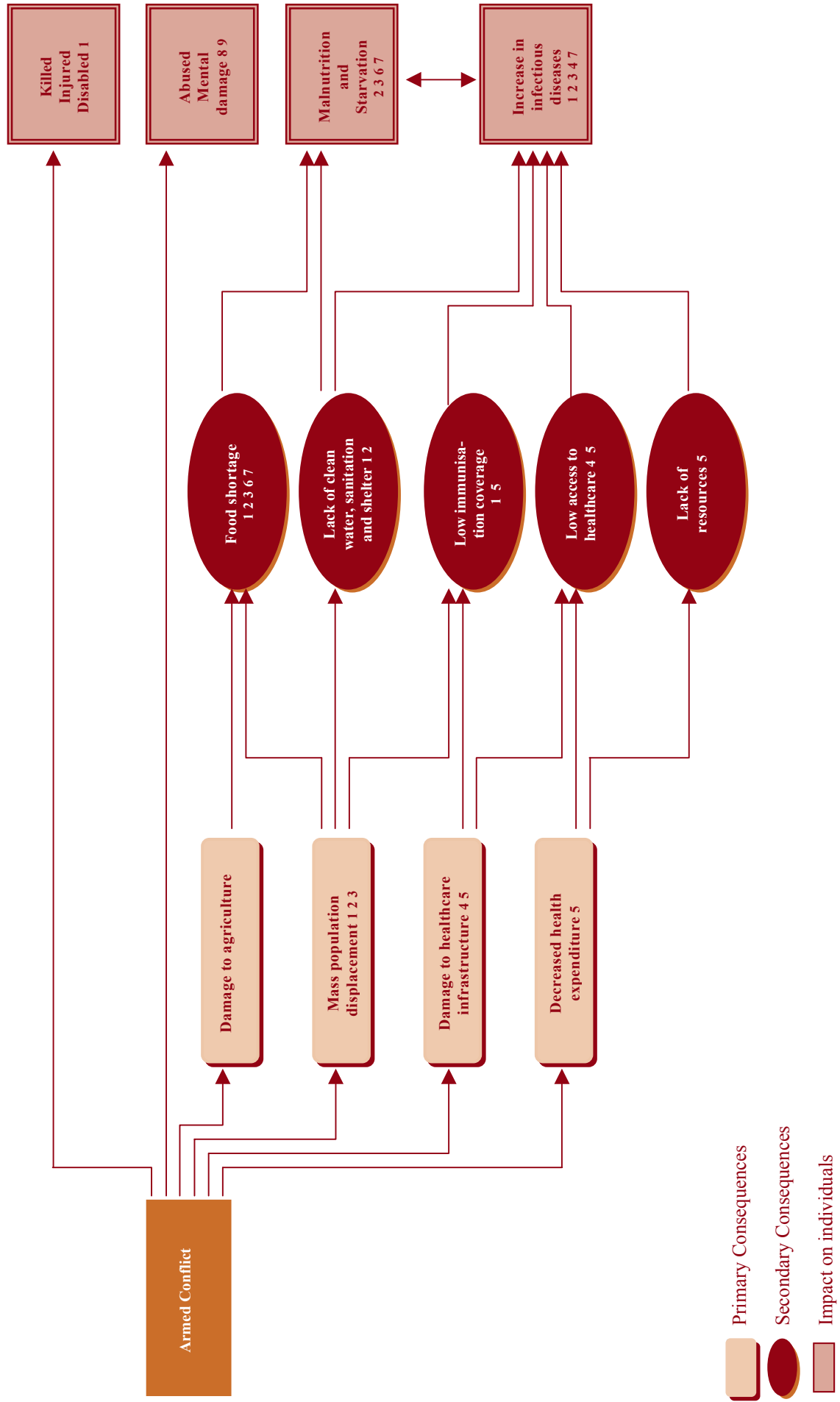
Literature Review

That armed conflict has a devastating effect on a community is an indisputable fact. The majority of the humanitarian responses in these situations are related to food, medicines and healthcare. The literature shows that in the last few years, health researchers have addressed some of these issues. The scope of the research however tends to be patchy, often concentrating on the same research topics, while neglecting other equally crucial and interesting questions. Health and nutritional conditions, particularly of refugee populations are frequently studied. Much less is known about the internally displaced or the communities resident in war zones. Similarly, damage to healthcare infrastructure, agricultural and micro-economic resources is rarely assessed.

A well-represented area is the mortality and morbidity surveys of refugee camps, largely because these have direct operational uses for fund-raising, estimating the number of people in refugee situations and in developing guidelines^{1 2} for aid delivery by implementing organisations. Nearly 50% of the studies captured by our searches involved populations in refugee camps. About 35% had residents as subjects and 15% dealt with the internally displaced (IDP). Although it is widely known that IDP constitutes a large proportion of conflict affected populations, logistical difficulties in access may be a deterrent to research.

Another area that has drawn much attention is the psychiatric studies among refugees and residents in zones of conflict. These studies typically measure the extent of exposure to "stressful events," e.g. witnessing killing and torture, and the impact of these stressors on the mental health and behaviour of people. Special attention is paid to the impact of armed conflict on children. This is illustrated by the creation of the United Nations Office for the Special Representative of the Secretary General for Children and Armed Conflict by the UN General Assembly in 1997. As a consequence, various studies have been performed on this issue and several conferences and UN meetings held to discuss research and principles governing protection of children and armed conflict.³

Fig. 1 *Impact of armed conflict on health*



Direct impact on individuals

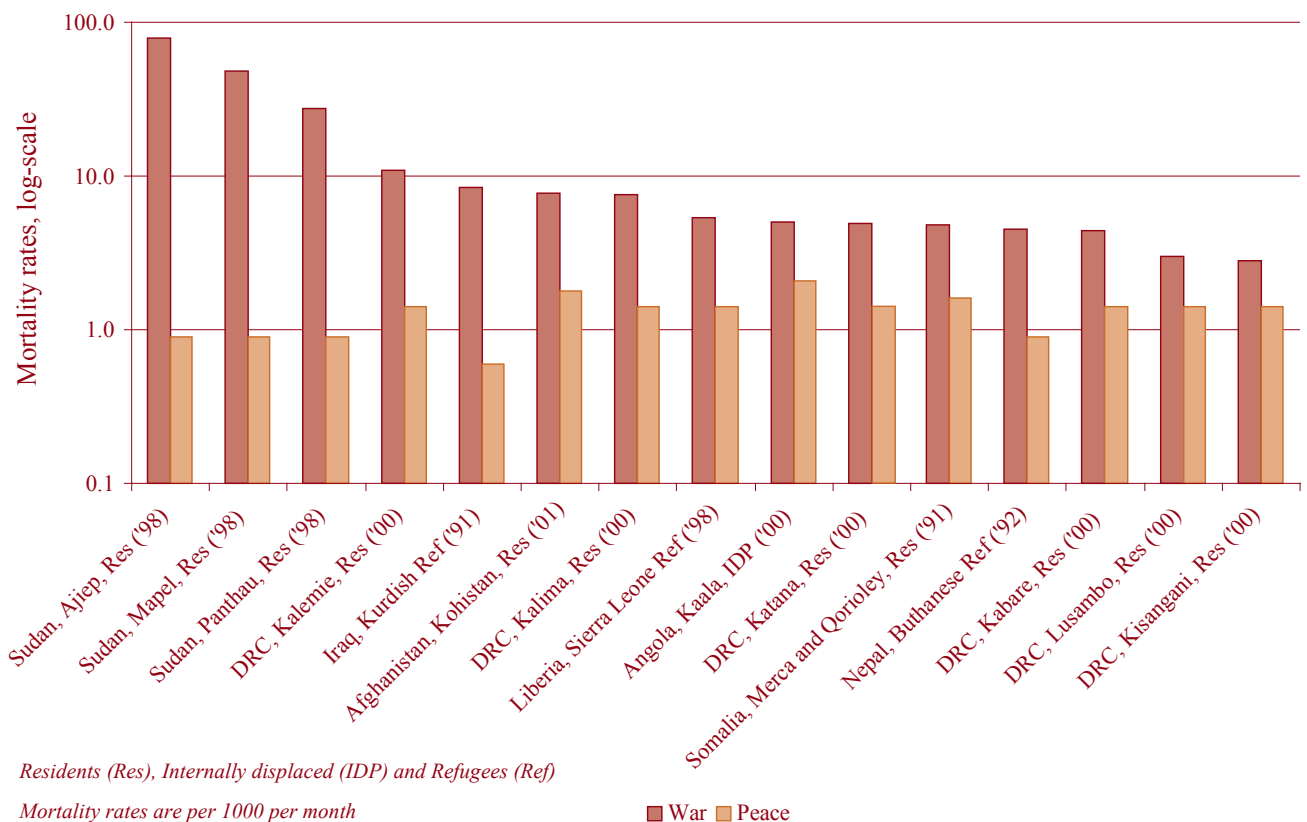
The direct impact of armed conflict on individuals is represented by the numbers who are killed, injured or disabled due to war trauma, e.g. detailed monitoring of mortality data has lead to estimates of 10.000 deaths per year as a direct result of stepping on an anti-personnel mine, while 20.000 are seriously injured by them. Deaths by small firearms, knives, swords and clubs have also been reported.⁴⁻⁷

The percentage of civilians killed and injured due to war trauma has been increasing from 14 % during World War I to 75 % during the 1980s and to even 90 % in conflicts that happened during the 1990s.⁸

It is said that the legal and illegal trade of small firearms (each responsible for a turnover of US \$ 7-10 and US \$ 2-3 billion respectively) as well as the widespread concept of ethnic cleansing are large contributors to this.⁹⁻¹⁰ Figure 2 shows the mortality rates of different conflict affected populations during periods of peace and war.

The second area of direct impact of armed conflict on individuals is due to sexual and physical abuse, e.g. rape (with the risk of sexual transmitted diseases),¹¹ slavery and the use of children as combatants.¹²⁻¹⁶ All these factors, in addition to the physical harm, cause extensive mental damage such as Post Traumatic Stress Disorder (in some cases for up to 90% of the population) and disturb personal development,¹⁷⁻²¹ with long term consequences on social development and the stability of a country.

Fig. 2 *Mortality rates in war and peace*



Direct impact on community

The consequences of armed conflict on a community vary at different levels. The first is the direct impact of armed conflict on physical infrastructure. This may be due to direct damage by fighting activities but also due to the absence of key structures during conflict periods. For example, an average of 30% of the population in 12 Sub Saharan African countries had access to clean water during conflict periods and only 20% could actually use sanitation facilities. As may be expected, the rural areas experienced worse conditions than did the urban areas. E.g. in Djibouti, during the conflict from 1990-1994, access to safe water and sanitation facilities were limited to 42% and 24% respectively of the rural population whereas in urban areas access was available to 86% and 66% respectively of the population.. These disparities push the people to move towards towns creating explosive slums and build up of additional political tensions.²²

In general, damage or non-maintenance of physical infrastructure has pervasive effects on many factors, including the economy and that in turn reduces the capacity of people to finance healthcare. Examples of these include the decline of air traffic in Djibouti by 54% compared with pre-conflict levels or marine fishing production in Eritrea that dropped from 54000 tonnes in 1954 to only 2000 in 1996.²²

This impact on general infrastructure is not shown in the flowchart because damage to infrastructure is directly related to the impact of all other consequences. As a result it would not only be linked to almost all of the boxes in the chart, but it would be conceptually redundant. Direct impact of armed conflict on agriculture, population displacement, healthcare, economics and their consequences have been discussed below.

Agriculture

Armed conflict damages agricultural structures and economy. Bombing and shelling destroy agricultural property such as livestock and land. The post Cold War conflicts have focussed on terrorising civil communities and in pursuing that goal, systematic destruction of agricultural land and cattle herds have been commonly practised. Household or village food stores and seed stocks are attacked and plundered by the conflicting parties, which leaves little resources for the civilian population.^{23 24} This situation is further aggravated in many conflict affected countries by the anti-personnel mines spread in cultivated areas. These prevent farmers from returning to the fields for years. Consequently, agricultural productivity is adversely affected. Since import of food is limited or non-existent during conflict, food shortages are inevitable and can be severe.

The number of people affected by food shortage is increasing with the emergence of a "humanitarian warfare", in which food is deliberately withheld in order to affect the civilian population of the opposing party. For instance, the people of Tubmanburg (Liberia) were denied access by the armed forces to the countryside to find food. Therefore, at least 15% of the population died of starvation before they could be reached by international aid agencies.^{25 26}

Mass population displacement

The direct danger of death, especially during ethnic conflicts, and because houses and property are damaged by warfare and plundering, inhabitants tend to abandon homes and flee. Part of this group tend to cross borders and become officially recognised refugees and therefore can be aided by international refugee organisations such as the UNHCR. The others tend to remain within their country's borders as internally displaced persons who have fled their homes. This group does not have access to refugee aid by the international community easily due to their dubious legal position. The global numbers of registered refugees and the estimated number of internally displaced persons are given in figure 3 for the years 1994 to 2000.

In such situations, the first health problem arises from the lack of food leading to malnutrition related diseases.²⁷ As is shown in figure 4, nutrition levels can drop to near famine conditions as witnessed in South Sudan in 1993. Three-quarters of the displaced children in Ayod camp and over 80 percent in Ame were recorded to have a weight for height of less than 2 standard deviations from the average standard, indicating acute malnutrition at a severe level.²⁸

Following nutritional distress, lack of shelter, sanitation and clean water are the next set of factors threatening the lives of the affected.²⁸ Having left their community and its services, these populations rarely have access to health services or education programmes, due essentially to not being part of the "host" community. Children, pregnant women and the elderly tend to fare the worst in these situations due to their biological fragility.²⁹

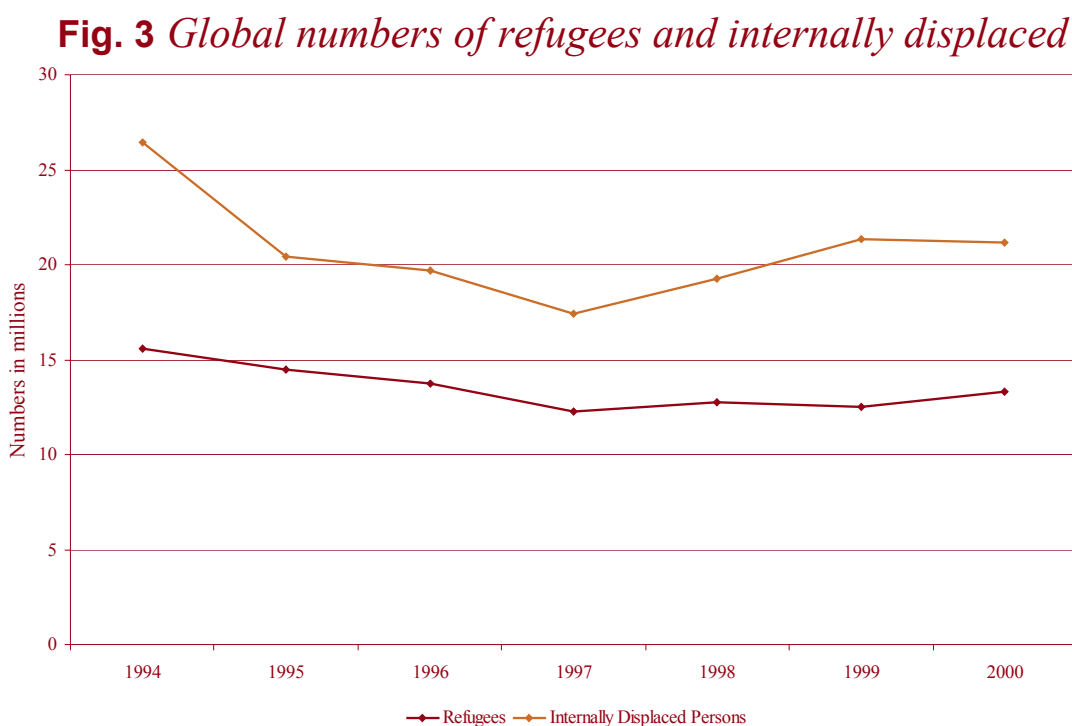
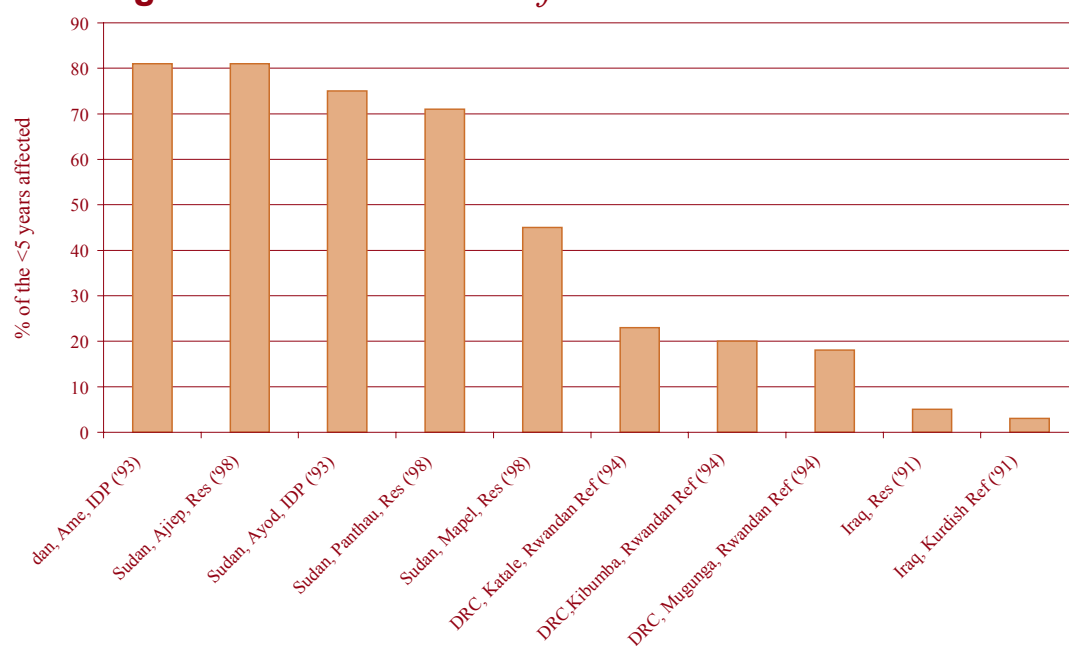
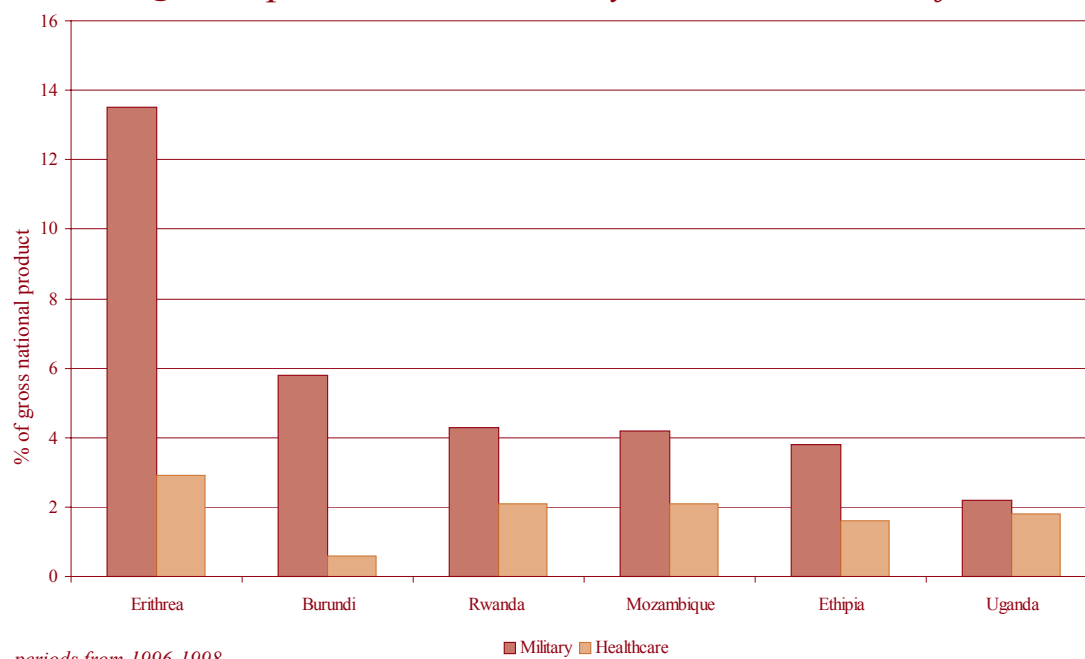


Fig. 4 *Malnutrition in conflict situations*



Malnutrition is weight for height, $z < -2$

Fig. 5 *Expenditure on military and health in conflict*



periods from 1996-1998

The single biggest cause of mortality among these victims of armed conflict is not trauma but the spectacularly high rates of infectious diseases often in epidemic forms. Cholera epidemics have occurred in refugee camps in Malawi, Zimbabwe, Nepal, Bangladesh, Turkey, Afghanistan, Burundi and the Democratic Republic of the Congo, case fatality rates ranged between 3 and 30 percent. Outbreaks of dysentery caused by *Shigella dysenteriae* type 1 have been reported since 1991 in Malawi, Nepal, Kenya, Bangladesh, Burundi, Rwanda, Tanzania and the DRC. In addition, epidemics of measles and malaria are reported from refugee and internally displaced populations.^{29 30}

Damage to healthcare infrastructure

Bombing and shelling, as well as the deliberate targeting of healthcare structures cause major damage to already fragile healthcare systems in poverty stricken countries. Often in countries where armed conflicts occur, the pre-conflict healthcare resources are usually at minimal levels and as a result, practically no healthcare is provided once the armed conflict damages the little that is available. Reports by the Save the Children's Fund on the Faryab province in Afghanistan in 2001 amply illustrates this point.^{6 31} Besides this, access to healthcare is frequently hazardous when combat zones block the roads to the healthcare units and hospitals. Consequently, people who had not did not fled die of conditions which the availability of even minimal services would have prevented.³²

Decreased healthcare expenditure

Typically warfare absorbs a large proportion of national budgets reducing substantially resources for public welfare programmes such as health and education. Expenditure for healthcare, maintenance of infrastructure of any public welfare sectors (e.g. education) are much decreased or frequently eliminated..²² Typically, salaries of medical and health personnel are not paid and basic supplies are not available, leading to the departure of qualified staff who rarely return.³³ Figure 5 shows that the expenditure on the military for countries that experienced a situation of armed conflict during 1996-1998 covers a larger part of the gross national product than healthcare, a distribution which is not seen in situations of peace.³⁴

Consequences for community public health

Due to prolonged food shortage, affected communities develop deficiencies of macro and micronutrients. Macronutrient deficiencies cause starvation and finally death itself.^{35 36} Whereas micronutrient deficiencies cause a deterioration of the immune system, wound healing ability and oxygen supply leading to high mortality and morbidity due to infectious diseases like measles, diarrhoeal diseases, respiratory infections, malaria and tuberculosis.³⁷

The increased risk of infectious disease due to lack of clean water, shelter and sanitation is mentioned earlier as effecting individuals, but on a community level, the epidemic potential of these diseases can be devastating.³⁸⁻⁴¹ A revealing example of the public health effects of armed conflict and (in this case) sanctions can be observed in the case of Iraq.

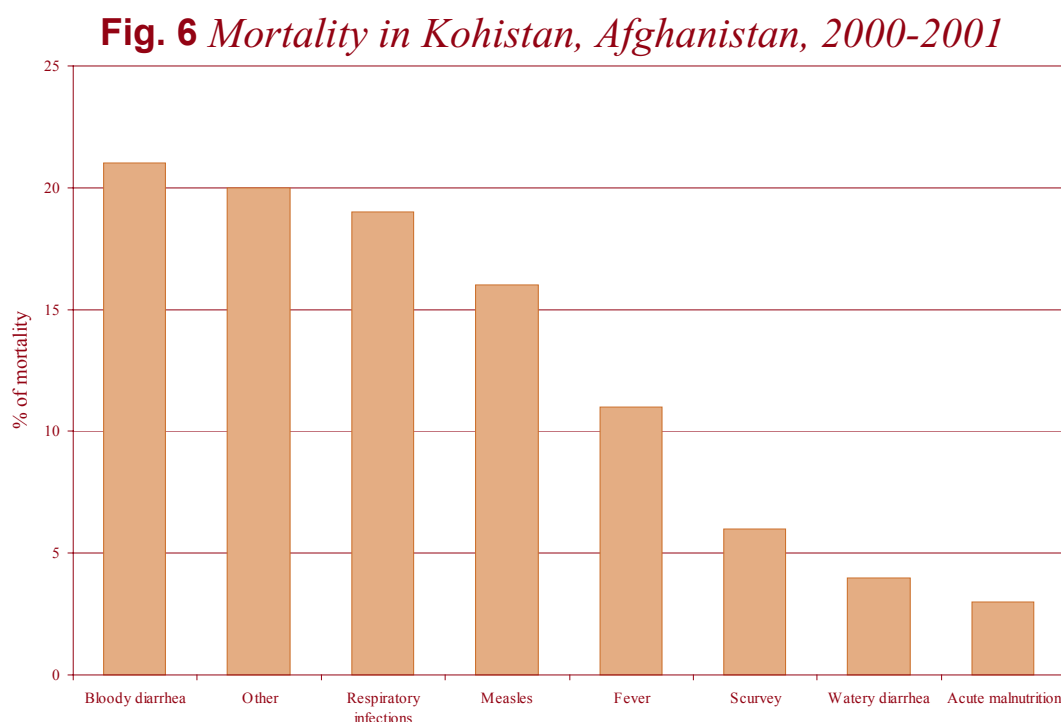
From the that the war started in 1991, sewage treatment in that country stayed at 50% of the pre-war capacity. In 1995, approximately 50% of the sewage produced by the 4 million residents of Baghdad was discharged untreated into the river Tigris, which had become the principal source of drinking water for downstream populations. During 1993, it was estimated that Iraq's solid waste collection system functioned at 25% of the pre-war capacity, with huge piles of garbage accumulating in the streets of the cities.⁴²

Decline in or suspension of vaccination programmes have very serious short and long term effects on child mortality and the incidence of epidemic diseases. Again in Iraq, immunisation coverage was 80% for all vaccines until 1990, but when vaccine services came to a halt during the war in January 1991, a resurgence of vaccine-preventable diseases was noticed. Polio cases went from 10 in 1989 to 186 in 1991 and diphtheria increased from 96 cases in 1989 to 369 in 1992.⁴²

Measles and meningitis have also been noted as major epidemiological risks in conflict affected communities.⁴³

⁴⁴ In addition as healthcare structures are dysfunctional, timely treatment of diseases is also not available.

Figure 6 indicates that a large part of mortality among populations in armed conflict is due to infectious disease.



Discussion *and* Conclusion

Discussion

As most research has been concentrated on refugee camp situations, where humanitarian aid agencies are present and research conditions are relatively favourable, very little is known about the consequences of armed conflict on resident and internally displaced populations. Since these communities can form a considerable part of the conflict affected population, it is imperative for future research to focus on these populations. The acute phase of an emergency is another area that has not been investigated well enough. There is a need to develop evidence based guidelines for the effective implementation of relief programmes. For this well conducted epidemiological research is necessary along with social science inputs. This will not be easy in these difficult circumstances, but will be essential in order to prevent the significant levels of excess mortality during the first phase of emergency situations. When data is available, it should be published with complete statistical clarity to ensure the quality and usefulness of the findings.^{45 46} While conducting this research, it was noticed that often essential parameters of data were not reported, rendering the information practically useless. E.g. sample sizes, population descriptives (age, sex, etc.), study periods and baseline data have to be available for further calculations. This unfortunately was rarely the case.

Conclusion

In general, it can be concluded that armed conflict has a direct impact on personal and on structural levels. The impact on community structures leads to starvation, high mortality and high morbidity rates due to infectious disease. A large amount of research has been done on these issues already but there remain key areas that require further study. Studies should be more complete and should provide all data that is necessary for further use in order to develop a correct policy.

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How do adverse health conditions affect conflict and security ?

Introduction

The spread of emerging § and re-emerging * infectious diseases (ERID) has been postulated as a threat to international security. The post September 11 anthrax episode underlined the great importance of addressing infectious disease monitoring and maintaining scientific capacity to respond. In addition, the major outbreak of Ebola haemorrhagic fever in Gabon, in December 2001, underlines the importance of these outbreak as an international concern. In this chapter, the background factors of the increased incidence and spread of ERID are explained, as well as the consequences of ERID in developing countries. Finally, the implications for the international donor community are noted.

Literature Review


The various impacts of adverse health conditions on security are described by studies undertaken by (among others) governmental, military and medical organizations. These studies mostly assess the threat of emerging and re-emerging infectious diseases because these appear to be the particular pose the greatest threat to international security.

In particular, the United States government Committee on International Science, Engineering, and Technology Policy (CISE) of President Clinton's National Science and Technology Council, established an interagency working group, chaired by CDC director Dr. David Satcher, to consider the global threat of emerging and re-emerging infectious diseases.¹ In 2000, the United States National Intelligence Council published a National Intelligence Estimate, in which the global infectious disease threat and its implications for the United States were explained.²

Several more of these security assessments have since been performed. In addition, the World Health Organisation and health institutions such as the U.S. Centers for Disease Control and Prevention (CDC) have published several reports on the threat of an increased spread of infectious diseases.^{3 4} Since infectious diseases have been identified as factors that could play a role in state failure, studies on this are also important for this analyses. Various institutions are currently working on the development of indicators and on ways of measurement and prediction of state failure, many of which include infectious disease.

§ Emerging infectious diseases are diseases that have either appeared in a population for the first time, or have occurred previously but are increasing in incidence or are spreading to new areas.³

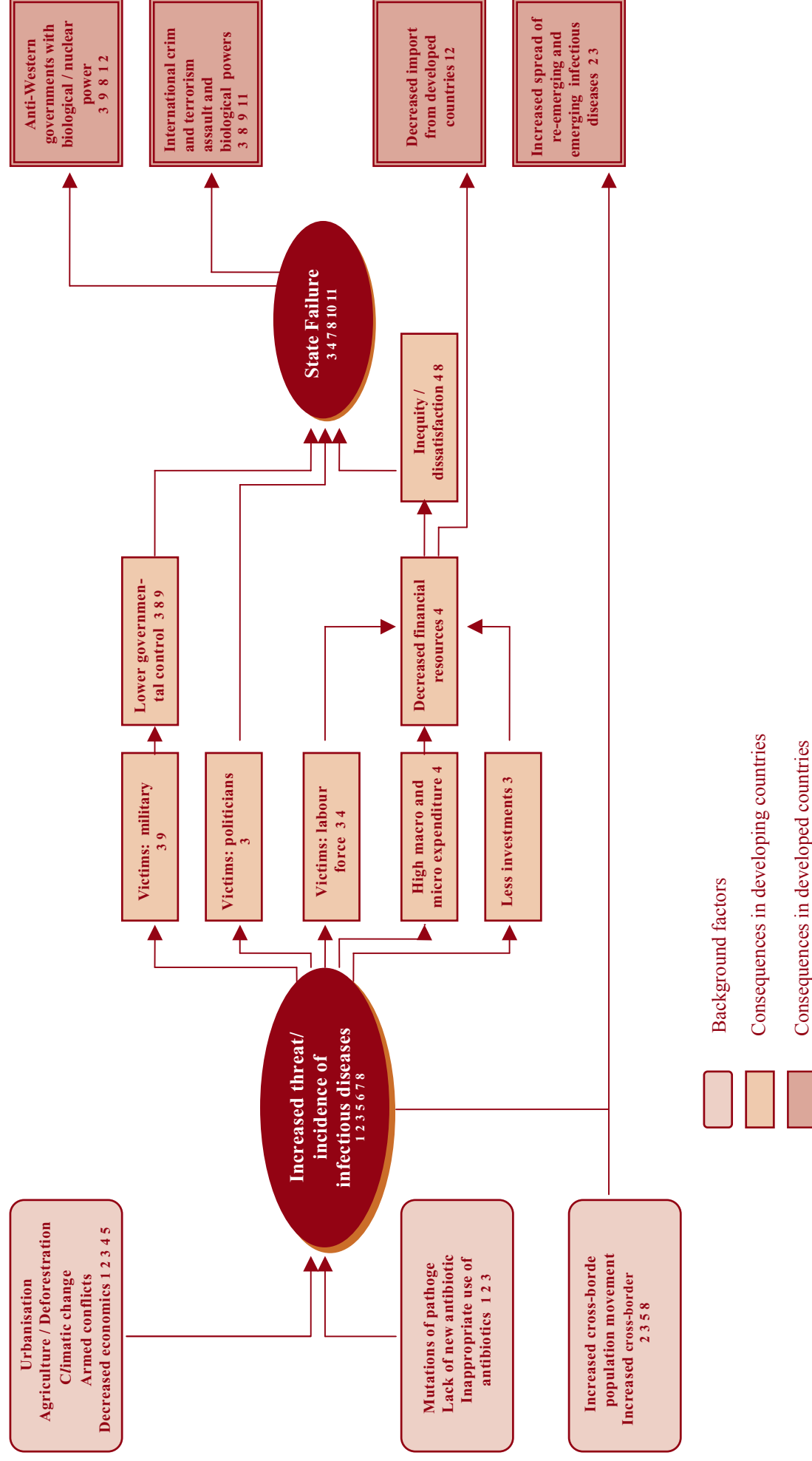
* Re-emerging infectious diseases are known communicable diseases that were once declining in a population but are now increasing again.³



A leading institution working in this area is the Center for International Development and Conflict Management (CIDCM) of the University of Maryland. They are performing a CIA commissioned study on indicators of state failure.^{5 6} The U.S. Army has also been studying the ways they could be involved in the response to or management of large outbreaks that could have serious political implications.^{7 8}

Particular attention is paid to the spread of HIV as it is a disease closely related to different facets of state stability. The United Nations Security Council resolution 1308 explicitly states this concern and special meetings on this subject have already been convened.⁹ Concern has also emerged on the possible contribution of peacekeeping forces to the spread of HIV.^{10 11}

Fig. 7 *The impact of adverse health conditions on security*



Background factors

The fact that infectious diseases are a threat to the health status of a population is clear. However, the recent dramatic increase of infectious diseases are now also considered a security problem. The threat of emerging and re-emerging infectious diseases (ERID) is increasing because of three major causes. The first is an increased incidence of ERID, the second an increasing drug resistance of the pathogens and the third is the increased transmission potential of infectious diseases.¹²

Increased incidence

Due to increased urbanisation and population growth, especially in developing countries, a significant proportion of the world population is becoming vulnerable to infectious diseases. Typically, sudden and large concentrations of people decreases the levels of sanitation, availability of clean water and adequate shelter. This facilitates the frequent occurrence of disease outbreaks. For example in Bangladesh after the independence war in 1971 and a severe food crisis in 1973 and 1974, there was a huge influx of refugees towards the city of Dhaka where they settled in slums with no clean water or waste disposal facilities. Consequently, one of the largest Cholera epidemics ever took place there in 1974.¹³

Yet another factor that encourages new outbreaks is the growing agricultural activity in proximity to forests and uninhabited areas that changes local environments and forces human settlements closer to wild animals. These changes in habitation patterns in turn encourage the emergence of new vectors and pathogens of infectious diseases. In the past 20 years, 30 new infectious agents that threaten human health have been discovered, including rotavirus, hantavirus and ebola.¹⁴

The use of new technology and industry are also considered as factors that promote the emergence of new vectors and pathogens. In these situations, new environments are being created that could become the habitat of certain vectors or pathogens to which humans have little or no resistance. For example, commercial egg-production with large numbers of hens on relatively small spaces has caused the emergence of *Salmonella Enteritidis*. Infections due to this bacterium have been increasing throughout Europe and the US so rapidly that by 1990 it surpassed *Salmonella Typhimurium* as the most commonly isolated serotype.¹⁵ Dengue fever and its recently noticed variant Dengue haemorrhagic fever is also a consequence of one of these changes.

Finally, countries with decreasing economic resources and as a consequence decreasing funds for health programmes fail to counter the spread of infectious diseases in an effective way. In the Former Soviet Union for example, a steep deterioration in health care services due to economic decline has caused the increase in incidence of diphtheria, dysentery, cholera and hepatitis B and C.²

Fig. 8 *Penicillin resistant pneumococci, UK. 1990s*

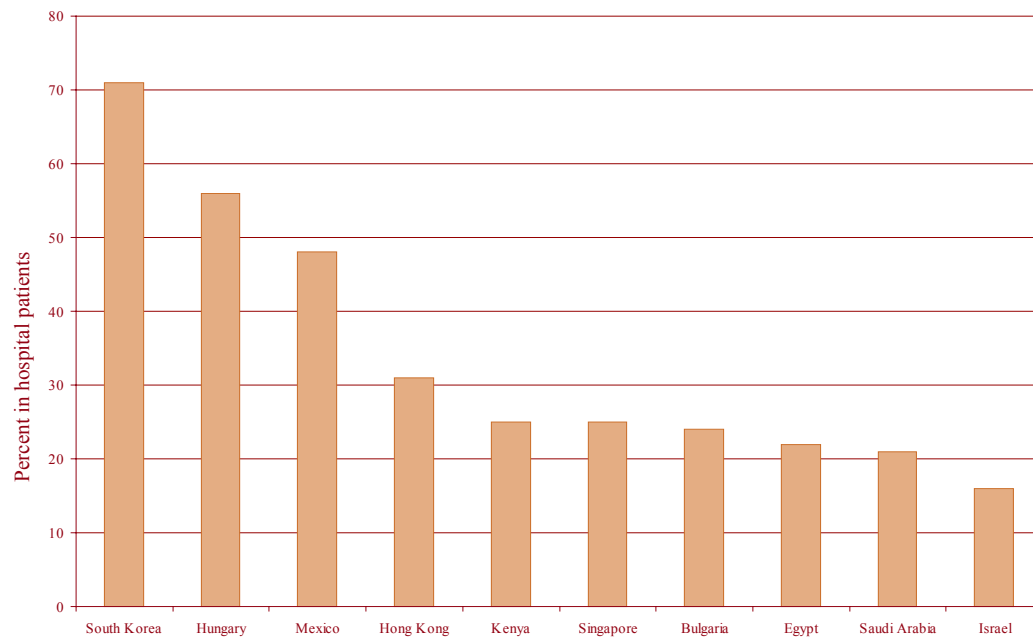
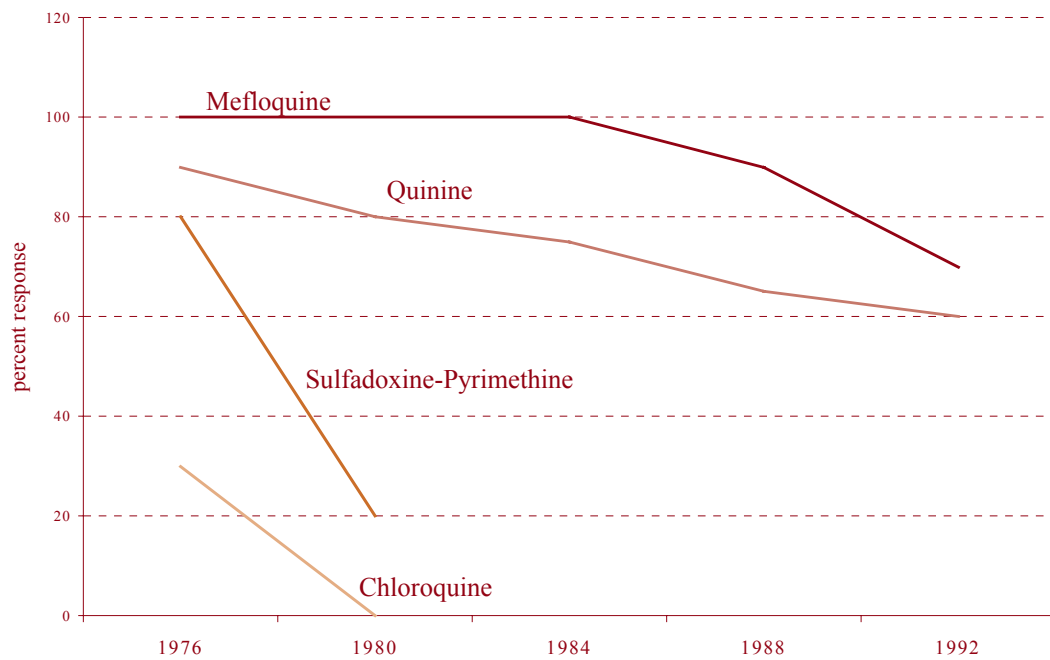


Fig. 9 *Response to antimalarial agents*



Increased resistance of microbial pathogens

Resistance patterns in vectors and pathogens are affected by mutations in microbes. Some mutations have adverse effects on the microbes whereas others improve survival. Evolution selects those with improved chances of survival. The inappropriate use of antibiotics in major parts of the world is increasing this problem, as it leads to increased survival of the resistant pathogens. In a study undertaken in Vietnam in 1997, it was discovered that more than 70% of the patients were prescribed inadequate amounts of antibiotics for serious infections while 25% were administered given unnecessary antibiotics. In 63% of the cases of proven bacterial infection in China, patients were given the wrong antibiotic while physicians in Canada and the United States, over-prescribe antibiotics in 50% of the cases¹⁷

Alongside the galloping increase in resistance, the response of medical science and the pharmaceutical industry is slow and unable to keep ahead in the race to counter resistance.^{16 17} The ability and preparedness of the international community to respond to and successfully control these diseases therefore becomes difficult and unpredictable. Figures 8 and 9 show respectively the large percentages of penicillin resistant pneumococci detected among hospital patients and the alarming decline in the response to antimalarial drugs.

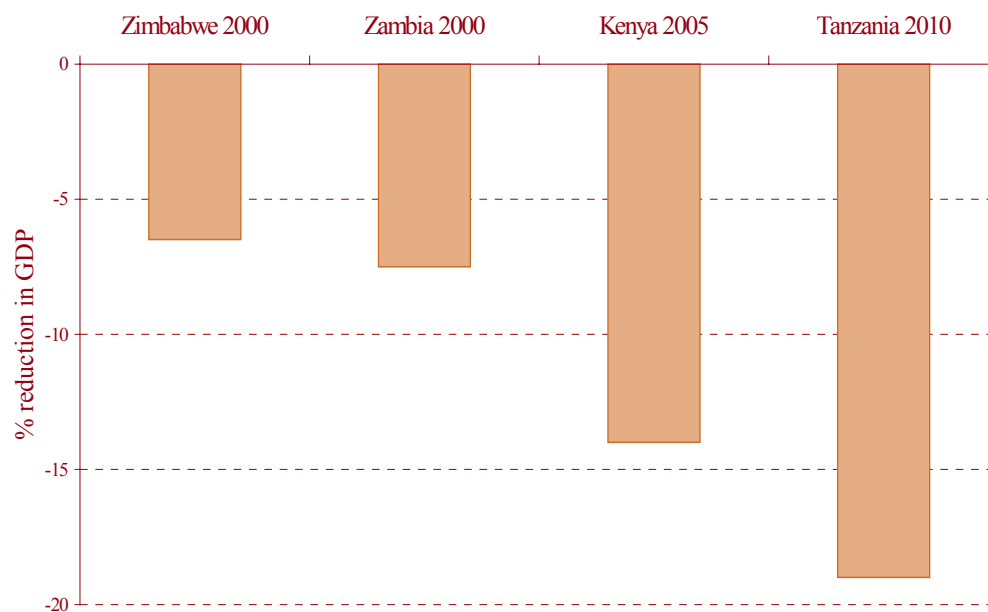
Increased transmission potential of infectious diseases

International travel has increased several folds in the last decade. In addition, simple cross border migration movements (civilian as well as military) to and from developing countries. This increased contact with countries endemic to various infectious diseases pose the possibility of rapid international spread following an outbreak. An example is the spread of HIV-2 from West Africa to the rest of the world. In the United States, the first reported case of AIDS caused by HIV-2 was reported in 1987 in a West African resident. In the 32 following cases, the infected individuals had all previously lived in West Africa or had sexual partners from that region. Consistently, the highest incidence of HIV-2 infections was reported in Portugal, France and Germany. The cultural and economic ties between these countries and West Africa has been hypothesised as an explanatory factor for this increase.^{7 14 18} An other example is displayed by figure 10, which shows the intercontinental spread of serotype A Neisseria Meningitidis between 1983 and 1989. Finally, international trade in foodstuffs such as fish or meat-products can be a threat to food security and requires further examination.

Fig. 10 *Spread of Neisseria Meningitidis type A*



Fig. 11 *Projected impact of AIDS on GNP*



Consequences for developing countries

Infectious disease with its wide ranging scope of causing morbidity and mortality has a major impact on all levels of society: political, military and labour. The economic implications of high infectious diseases incidence to countries that are severely strapped for resources and that need to focus on growth and development are considerable, for controlling outbreaks becomes a serious strain on their limited means. Foreign investment is also affected as investors are turned off by the prospect of labour shortage and illness leading to productivity loss.

Political consequences

The links between infectious disease and political instability seem rather tenuous. However, many research groups are working to define these links. Convincing evidence remains elusive. Some of the main lines of thought are summarised below.

Infectious disease related mortality among administrative officers and politicians is postulated to lead to political instability and creates power vacuums and struggles for resources. In those situations, the outcome is often state failure. Some reports discuss consequences on the military which include the death or disability of officers and trained combatants, weakening a legitimate government and encouraging crime and terrorism. In 1997, for example 9% of the HIV infected women in Rwanda were married to farmers, while for women related to military or government employees these percentages were 22% and 38% respectively. The increasing practice of recruiting children for combat in poor countries has been linked to high mortality frequently due to AIDS among combatants in rebel and government armies. As young men become scarcer or die off from the ranks, the temptation to recruit from younger age groups becomes stronger and often remains the only option to keep up the numbers of troops..^{7 14 19-22}

Economic consequences

High mortality and morbidity from infectious diseases directly affects the labour force. Many of the most widespread and debilitating diseases such as Malaria, Dengue fever and AIDS affect men and women in productive and reproductive age groups. As a direct consequence of this, Namibia for example is expected to fall by a factor of 10% in the human development index by 2006 and Ethiopia is expected to fall by 15% by the year 2010.^{8 23} Reduced foreign investments lead inevitably to increased budget deficits and private financial resources are expected to decline because of increased expenditure on medical treatment.

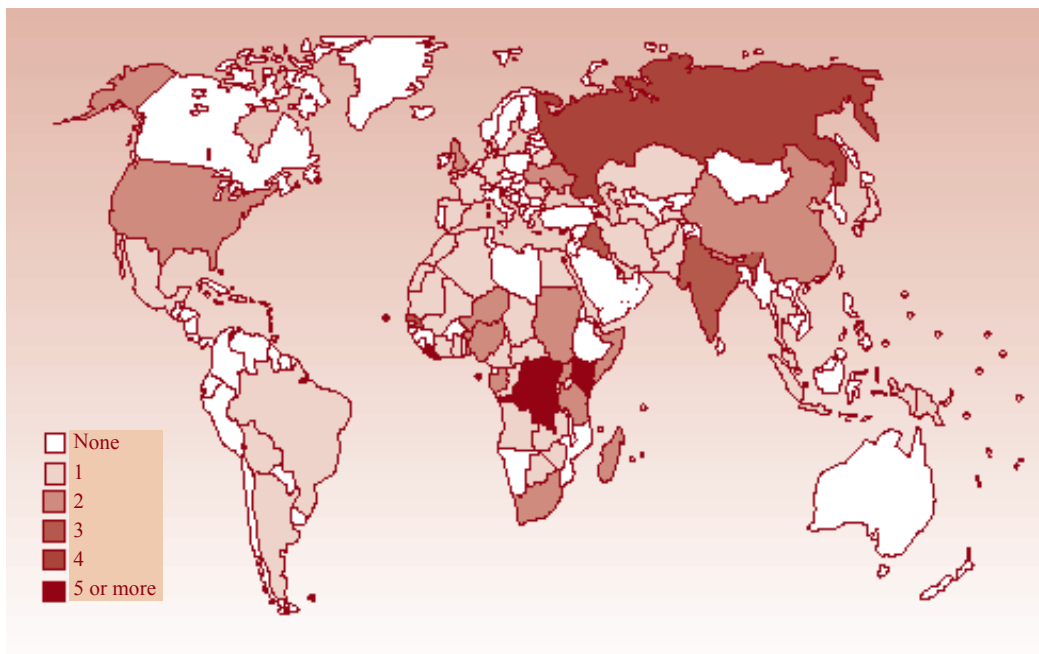
To respond to the drop in health status, government expenditure on healthcare programmes will have to be increased at the cost of other social areas. In India, for instance, the cumulative cost of AIDS exceeded US \$ 11 billion and in Cambodia, the direct impact of HIV on the economy may reach US \$ 2 billion by 2006. Figure 11 displays the projected impact of AIDS on the gross national product for some countries in Sub Saharan Africa. Due to the financial shortage, inequities increases and population dissatisfaction sets in, leading to social and political instability and possibly to state failure.^{7 24}

Consequences for the developed world

The impact of the problem of infectious diseases in developing countries has been considered of little concern to the developed world, as witnessed by the spectacular fall in tropical disease research since 1960 onwards. Today however, the links between the occurrence of infectious disease outbreaks in developing and the industrialised countries are clear. This is one of the reasons why countries such as the United States are focusing on this area.

Firstly, there is the direct spread of emerging and re-emerging infectious diseases through cross border movement and international trade, which could lead to the rapid international spread of a disease outbreak. More than 30 unexpected outbreaks of previously unknown pathogens took place between 1994 and 1999 all over the world.¹⁴ Increase in cross border trade of food products combined with the use of new technology in the bio-industry could cause the rapid spread of both unknown and known infectious diseases among animals and humans.² A special concern here is the increasing presence of Western armed forces in areas with high infectious diseases incidence.^{24 25} Another example comes from Russia where, in 1985, 5% of the Russian draftees were rejected due to health reasons. Today, this figure has increased to 30%. Studies conclude that this reduction in the human resource base for the maintenance of law and order has aggravated the social stability conditions in the country.^{2 22 26}

Fig. 12 *Outbreak reports, 1997*



The number of reported outbreaks of infectious diseases in 1997 is indicated for different regions in the world in figure 12.²² Several reports have argued that spectacular disease outbreaks or deadly viral diseases can contribute to state failure leading to lowered security, increase risk of biological warfare and bypassing of arms treaties.

Infectious disease related trade disruptions

Infectious diseases will continue to cause costly periodic disruptions in trade and commerce in every region of the world.

Avian flu in Hong Kong

The avian influenza outbreak in 1997 cost the former colony hundreds of millions of dollars in lost poultry production, commerce, and tourism, with airport arrivals in November of that year alone down by 22 percent from the preceding year.

BSE and nvCJD in Britain

The outbreak of BSE and new variant Creutzfeldt-Jakob disease in the United Kingdom in 1995 prompted a mass slaughter of cattle, drastically cut beef consumption, and led to the imposition of a three-year EU embargo against British beef. The losses to the British economy were estimated by the WHO at \$5.75 billion, including \$2 billion in lost beef exports.

Cyclospora in Guatemalan raspberries

The outbreak of cyclospora-related illness in the United States and Canada associated with raspberries from Guatemala led to curbs in imports that cost Guatemala several million dollars in lost revenue.

Cholera in Peru

The outbreak of cholera in 1991 cost the Peruvian fishing industry an estimated \$775 million in lost tourism and trade because of a temporary ban on seafood exports.

Foot and mouth disease in Taiwan

In 1997 an outbreak of foot and mouth disease (FMD) devastated Taiwan's pork industry—one of the largest in the world—shutting down exports for a full year.

Nipah in Malaysia

In 1999, the Nipah virus caused the shutdown of over half of the country's pig farms and an embargo against pork exports.

Plague in India

The plague outbreak in Surat, India, in 1994 and ensuing panic sparked a sudden exodus of 0.5 million people from the region and led to abrupt shutdowns of entire industries, including aviation, and tourism, as several countries froze trade, banned travel from India, and sent some Indian migrants home. The WHO estimated the outbreak cost India some \$2 billion.

Discussion *and* Conclusion

Discussion

Recently many governmental and health research institutions have explored political and social impact of infectious diseases. But the debate on political consequences of these diseases especially in terms of state failure or reconstruction consists at the moment merely of hypotheses. Available research does not permit discussion on causal relations based on quantitative data between infectious diseases and state failure. This is to a certain extent also the case with the assessments of the threat of infectious diseases. Hypotheses exist and appear intuitively attractive but there is little empirical knowledge to substantiate the theories.

Conclusion

Recently many government and health research institutions have explored the political and social impact of infectious diseases. But the debate on the political consequences of these diseases especially in terms of state failure or reconstruction consists at the moment of theoretical concepts. Available research does not permit discussion on causal relationships based on quantitative data between infectious diseases and state failure. Hypotheses exist and appear intuitively attractive but there is little empirical knowledge to substantiate the theories.

The links between infectious disease outbreaks and social discontent is debated and debatable. With the recent episode of Anthrax contamination, the threat of bio-terrorism has also become a reality. However, despite research interest, there is little scientific evidence on which to develop practical international policy or health sector responses.

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How can the delivery of health services play a role in reducing conflict ?

Introduction

A good health status is considered one of the most valuable aspects of life. Healthcare and medical sciences are regarded as the "protectors" of the good health status. As armed conflict is a major threat to the health of a population, it could be regarded an objective for the medical profession to help reduce conflict and its consequences.^{1 2} In 1864, the Red Cross was founded specifically for this purpose. Other health agencies, such as the Nobel Prize winning Médecins Sans Frontières, have also been involved in dealing with the consequences of war. Healthcare could contribute to conflict reduction in two ways. Health as a bridge for peace efforts, which principally lies in medical co-operation between health care professionals of all parties in a conflict. This co-operation is applicable at different stages of a conflict, with different ways to reduce conflict. The second way conflict can be reduced is through the implementation of humanitarian cease-fires.³⁻⁵

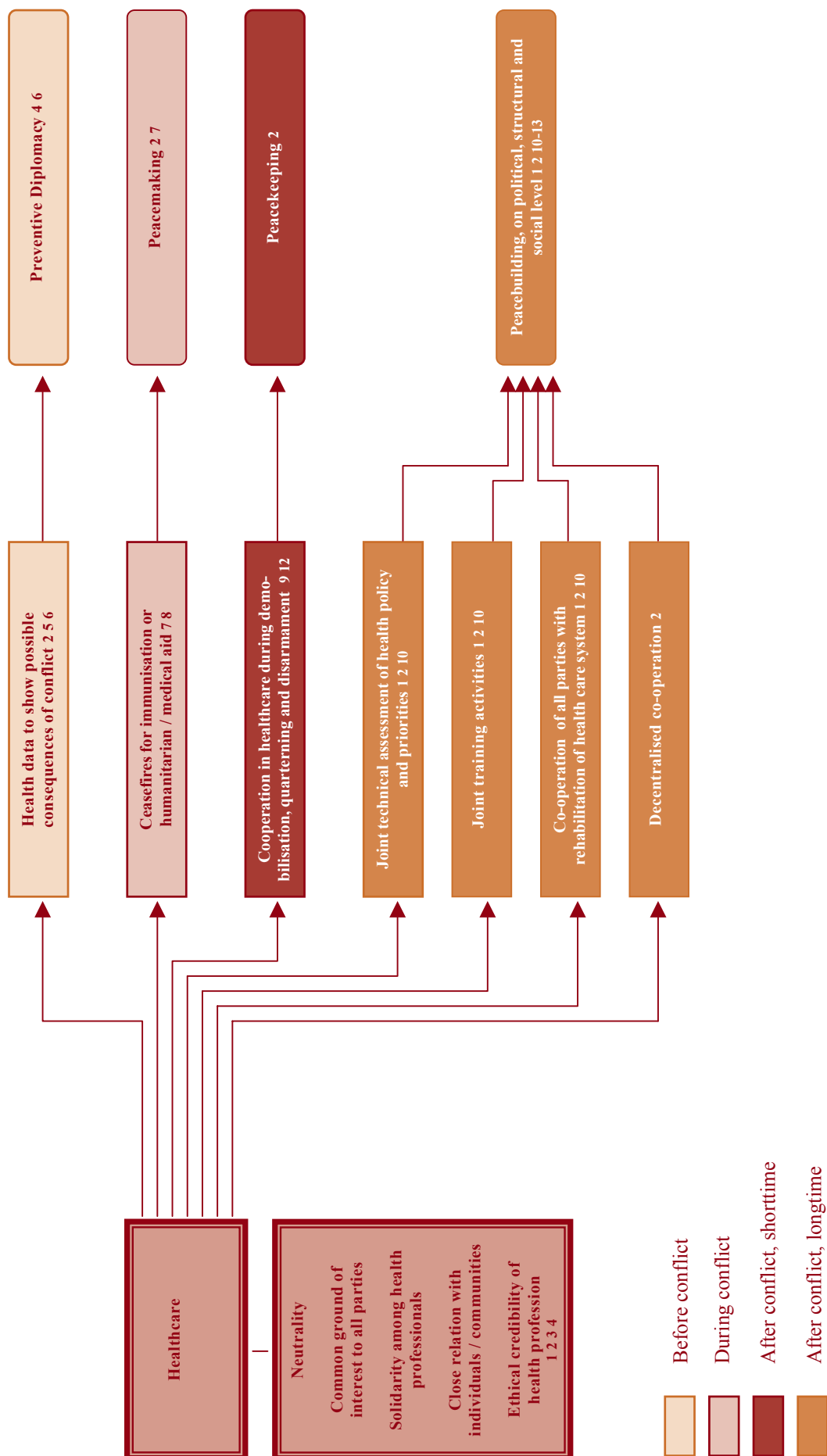
Literature Review

In the 1980s, the Pan American Health Organisation already used the term "Health as a Bridge for Peace" and in 1981 the World Health Assembly stated in resolution 34.38 that "The role of physicians and other health workers in the preservation of peace is most significant for the attainment of health for all." Since then the WHO has been implementing the peace building principles in its health programmes. In 1998, the WHO included health as a bridge for peace as a part of the Health for All in the 21st Century Strategies.⁶ The concepts and case descriptions of health as a bridge for peace efforts are a major source for this analysis.

An important United States initiative that also addresses health as a bridge to peace issues, is the "Linking Complex Emergency Response and Transition Initiative (CERTI)" of the USAID, consisting of a network of academic and non-academic institutions.[§] CERTI investigates the possibilities for the incorporation of development initiatives in humanitarian / medical aid programmes. The ways in which healthcare services could contribute to conflict reduction is part of this. Some data is published in relation to this initiative.

§ Center for Peace Studies McMaster University; Center for International Health George Washington University; Civil Military Alliance to Combat HIV and AIDS; Harvard Center for Population and Development Studies Harvard University; International Center for Migration and Health; Center for International Emergency, Disaster, and Refugee Studies John Hopkins University; Department of International Health and Development Tulane University; Center for International Development and Conflict Management University of Maryland.

Fig. 13 *How health services can play a role in reducing conflict*



Why medical profession

Medical science and the profession is involved in the conflict reduction efforts principally because of the moral imperative, but also because it has certain characteristics, which makes it suitable for this purpose. The medical profession is commonly considered as being impartial, for it supports no particular political, ethnic or religious party. On the basis of the Hippocratic oath, its professionals cannot refuse medical assistance to anyone in need. On the other hand, those opposed to the involvement of health personnel in peace efforts also use this argument, which by definition is political in nature. In Haiti for example, support to the health care system from 1991-1994, required a strong involvement of the UN and an approval by the ruling military regime. This compromised the neutrality of the humanitarian medical assistance and as a consequence, tensions were exacerbated rather than reduced.⁷

As stated earlier, prolonged life and good health is valued in most cultures and situations. So in conflict situations when value systems fall apart, medical care and health interventions remain a common ground of interest to all parties involved in a conflict. This provides significant opportunities for negotiation and co-operation.⁸ Medical care serves one goal - a healthy life for everyone. Consequently, in practice, certain solidarity generally exists among medical professionals, no matter which political side they belong to. This is illustrated by the unprecedented co-operation of the Croat and Serb health professionals during a rehabilitation project in the Eastern Slovenia region of Croatia in 1995.⁵

As a general rule, strong medical ethical principles are shared by medical practitioners. Health professionals are therefore trusted by communities and are able to develop privileged contacts with individuals and groups.^{5 9 10}

Preventive Diplomacy

Conflict has a major adverse impact on the health situation, but this does not prevent people from engaging in armed conflict. An opportunity for the medical profession to change this, is to demonstrate clearly the real and complete effects of armed conflict in human populations. This is especially pertinent in relation to certain modern weaponry and tactics, which cause far greater damage than is necessary for strategic purposes. In this context, campaigns are undertaken by the International Physicians for the Prevention of Nuclear War (IPPNW) against the use of nuclear weapons, land mines and small arms.¹¹ In February 1999 for example, a IPPNW delegation to India and Pakistan met with India's Prime Minister and Defence Minister to advocate the abolition of nuclear weapons. Physicians for human rights is another such organisation battling for the recognition and implementation of human rights in totalitarian and other oppressive regimes.

Fig. 14 *Polio eradication*

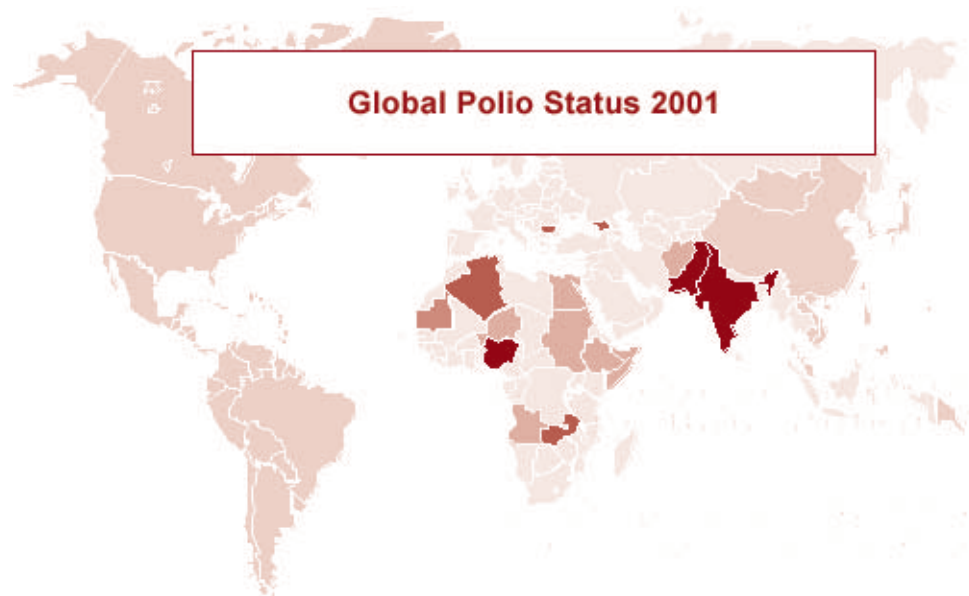
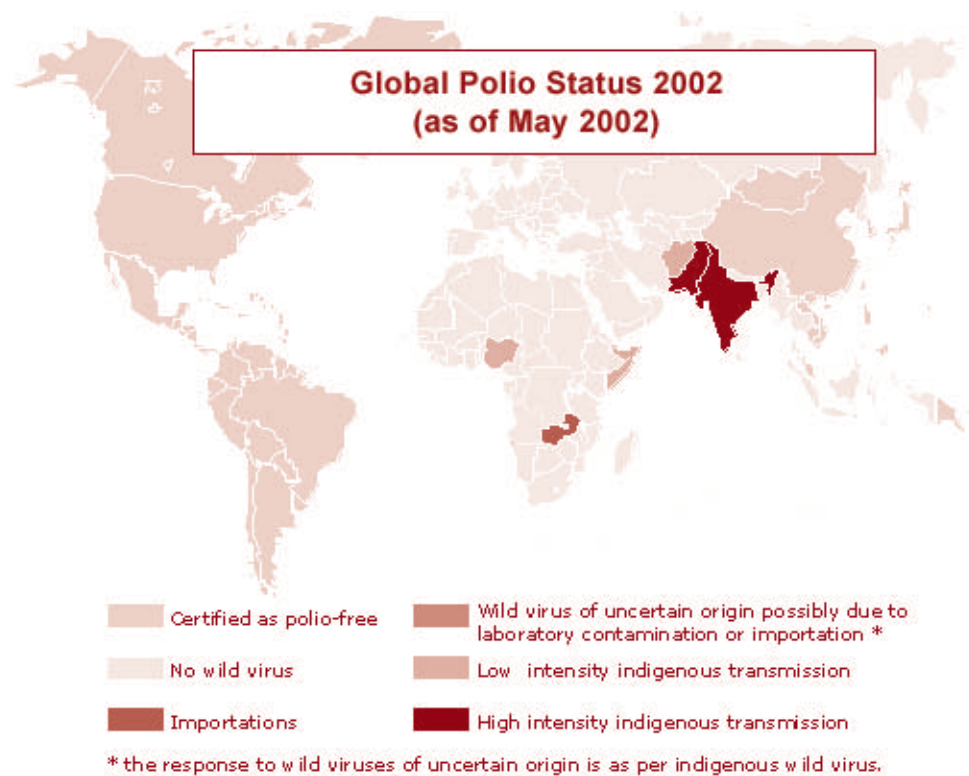


Fig. 15 *Polio eradication*



Peacemaking

During conflict, healthcare systems are damaged or do not exist at all as explained in chapters one and two. The only opportunity for international humanitarian aid to provide health services to the victims of the conflict in these circumstances is by negotiating cease-fire. This has been done successfully by the poliomyelitis eradication programme personnel in several countries. In El Salvador, cease-fires and days of tranquillity were successfully negotiated in 1985 and 1991. Similarly, days of tranquillity were obtained from warring parties in Afghanistan during 1994-1999 and in 1999 in the Democratic Republic of Congo in which 8 million children were given the Oral Polio Vaccine. For this latter effort, an intervention by the Secretary-General of the United Nations, the Director-General of the WHO and the Executive Director of UNICEF was organised.

Figure 14 and 15 show that the world is nearly polio free at the moment, except for in conflict areas (Angola, the DRC, Liberia, Sierra Leone, Somalia, the Sudan, Afghanistan and Tajikistan), where access is extremely difficult.¹²⁻¹⁴

Cease-fires have also been negotiated for the delivery of resources for humanitarian aid and to obtain access for medical professionals to wounded people (Médecins Sans Frontières in June 2000 in Kisangani, DRC).^{7 15-19}

Peacekeeping

A permanent cease-fire is usually followed by the demobilisation, quartering as well as the disarmament of troops of all parties.⁵ A key factor in this phase is to maintain the cease-fire and to prevent the resurgence of tension and conflict. Medical professionals of both parties can work together on the provision of medical services to all those in need and in addition, they will have to assess medical aid and establish a healthcare system. This highly technical co-operation usually establishes the basis for co-operation and starts up a dialogue in areas of joint interest. This occurred for instance in Angola when the Lusaka Protocol was signed in November 1994. The social, economic, institutional and physical structures of the country were completely destroyed by then. The disarmament, quartering and demobilisation of the UNITA troops were the direct responsibility of the UN system. This included humanitarian assistance to the UNITA soldiers and their dependants during the quartering and demobilisation process, which involved approximately 250.000 persons. WHO among others accounted for the health care provision for these people and the start of the rehabilitation of a health care system. Significant progress was achieved by bringing together officials from the Ministry of Health and health professionals from the UNITA. During this co-operation immediate healthcare needs could be identified and a joint training programme was established.^{7 20-22}

Peacebuilding

In the long-term, communities will have to be rebuilt. Most of the healthcare system will have been destroyed, including buildings and infrastructure. Therefore, a new system will have to be developed which can serve as a constructive channel in a highly tense situation. Peacebuilding can be divided into a political, structural, and social level.

I) Political peacebuilding is the establishment of political agreements and the rebuilding of the legal system. Healthcare can play a role in this by urging for agreements on healthcare system issues, at the level of the ministry of health. This has been applied in the case of Eastern Slovenia, which was to be reintegrated into Croatia in 1995. The WHO contributed to this by playing a role in the facilitation of negotiations between the ministry of health of Croatia and the Eastern Slovenian leaders.⁷

II) Structural peacebuilding involves the development of structures required to support the implementation of a peace culture. Medical professionals have to set up training programmes and push towards a new healthcare structure. They assess immediate needs and develop programmes to anticipate future demands for services. This is usually done in co-operation with health professionals from former conflict parties. As essentially technical matters, common grounds of interest may be discussed, instead of issues of disagreement. An example is the case of Angola in 1994, where the WHO played an important role in the development and implementation of the health program during the quartering and demobilisation phases. In collaboration with health professionals from both government and UNITA disease control programmes, health information systems and training courses have been set up.^{7 20}

III) Social peacebuilding is the return of mutual understanding in the beliefs and values of all former parties in order to establish a community, with a normal inter-communal life. Healthcare can play a role in this by co-operation and showing people that working and living together in acceptance of each other is necessary to the re-establishment of a situation where there is health for everyone on a basis of equality. An example is the situation in Bosnia and Herzegovina where after the war, in 1997 the reconstruction programme brought parties together through the creation of inter-party physicians' associations and external networks.^{7 20 23 24}

Decentralised co-operation

A special part of the peacebuilding efforts is the decentralised co-operation principle. This was applied in 1997 by the WHO in Bosnia and Herzegovina, when 22 Bosnian towns were linked in a network with 29 Italian local committees representing municipalities, provincial administrators and NGO's

Discussion *and* Conclusion

By being linked to these Italian structures, the Bosnian towns could develop their own infrastructure and rehabilitation. There has been an exchange of resources, knowledge and practices. As the effort proved successful, this experience could serve as a lesson for other similar situations.^{5 25}

Discussion

Data related to health as a bridge for peace efforts consists mainly of descriptive case analyses. There are few evaluation studies, but these are frequently not comparable because the situations in the various cases differ too much. In some cases the context involves a full-blown civil war and in others a government has to face small armed groups. Also the concern and intervention of the international community varies largely between the different conflict situations. In Haiti for example between 1991 and 1994, the international community essentially tried to overthrow the military regime by the enforcement of an embargo. Health organisations tried to protect the population by implementing humanitarian assistance programmes. This case is far from comparable with the civil war in Bosnia and Herzegovina in 1992-1995, that destroyed most of the country. In this case, the international community was deeply involved, both politically as well as militarily.⁵ Situations vary widely and methodologically valid research remains scarce.

Conclusion

In general, there are undoubtedly several possibilities for medical and health sector professionals to participate in the reduction of conflicts. Especially since the main bulk of humanitarian assistance consists of medical aid and nutritional interventions. Future research will have to demonstrate the contribution of these efforts towards peace building and improve cross country comparability in order to allow conclusions that will change policy.

Report conclusions

This report has reviewed the different ways public health, armed conflict and global security interact through a desk study of published and unpublished works of specialised institutions. As was expected, the above subjects cover a vast area of research and practice. Institutions of various disciplines as well as large numbers of UN, governmental and non-governmental institutions are working in the different fields related to public health, armed conflict and global security.

As a consequence, our review does not document all research and practice that has been done and some key pieces of work may have been overlooked. Our data collection stopped at an artificial time limit and as a result, interesting work that could have been encountered after this period is not included. Nonetheless, this review picks out the main trends in findings.

Literature or groups undertaking work in specific sub-areas are cited with full contact references. An important conclusion could be noted is that certain sub thematic areas receive disproportionate research attention while others, although acknowledged, are neglected. Also systematic and conclusive research is rare both by epidemiologists/public health or political science/international relations researchers; although the latter seem to have published more and display a more sustained interest in the subject matter.

Infectious disease, especially in zones where surveillance and control mechanisms have broken down should be a major concern to the international community. The potential of the complex interactions of AIDS and social disruption is getting increasing recognition. This review pulls together the main ideas but conceptual clarifications and international policy options still need to be worked out.

Armed conflict and public health interact in many different ways. While it seems stating the obvious to say that conflict is bad for health, it is nonetheless important to examine precisely the various components of the interaction. It is only by this knowledge that effective interventions can be designed. A more complex issue involves the interface between infectious diseases and world security. Bio-terrorism and highly fatal haemorrhagic disease outbreaks have risen in priority on global agendas. Health of populations in poor, tropical countries have now become global issues. Finally, the effect of the delivery of health care services on conflict seems to be a promising avenue, not only for the protection of community and individual health, but also as a thin end of a wedge to introduce peacebuilding efforts in a turbulent social situation.

Report conclusions

Survival of civilian communities in low intensity war situations is an undeniable priority for all involved parties. International policies in humanitarian assistance have not excelled in the recent past in creating the right grounds for stable, equitable and democratic follow through. Education and health sectors, key for social stability, have paid the price.

There are several highly reputed groups involved in examining some of the areas outlined in this report. However, most of the evidence base is weak. Clarification both conceptual and empirical is required to understand how political processes in nation building interact with public welfare sectors at community levels. On the other hand, the costs of civil conflict in setbacks to health progress and disease eradication and control are also relatively unknown.

The health and survival of all these people depend on stable international policy on regional reconstruction and development aid. The research community typically chooses stable situations for research sites, but the fact remains that most parts of the African continent, large proportions of South America (El Salvador, Columbia, Peru) and many of the particularly poorer populations of Asian countries are in turmoil.

A research framework that sets out the parameters for a concrete and closer collaboration between political scientists, sociologists, international lawyers, epidemiologists and public health specialists would lead to more rational and effective international and national policy..

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