

Health in Humanitarian Emergencies

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Principles and Practice for Public Health and Healthcare Practitioners

Edited by

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Foreword

Background

In 1976, soon after completing a Diploma of Tropical Medicine and Hygiene in London, I found myself at the remote camp of Ban Nam Yao in the mountains of northern Thailand. I had just been employed by a small American NGO to be director of the health program for fifteen thousand Laotian refugees, including a 60-bed hospital that was under construction when I arrived. Starting with two Australian physicians and two Thai nurses, our team gradually expanded to a peak of six doctors, ten nurses, and a laboratory technician, from six countries, including two Lao nurses from the refugee camp. In addition, a number of refugees were trained as nurse aides, some of whom had been medics in the Lao Army. Of historical interest, this was the first refugee setting where doctors and nurses were mobilized by the new French organization, Médecins sans Frontières (MSF), which had been founded five years earlier.

All of us had clinical backgrounds, and our work focused almost exclusively on the hospital outpatients and inpatients. Once a week, we would conduct a mobile clinic for one of the Thai villages in the area. None of us had training in public health let alone epidemiology, a discipline some of us had never heard of. At that time, there were no reference texts, manuals, or guidelines that focused on health in refugee camps, and even if we had been able to access the published literature we would have found almost no articles relevant to the context we were working in.

Confined to clinical roles, we conducted no surveys of nutritional status or any other key indicators of population health. We only collected statistics on hospital inpatients and outpatients, and routine vaccination was limited to children who accessed the hospital. Following outbreaks of typhoid fever and gastroenteritis, we eventually trained a cadre of volunteers who conducted health education in the camp. We paid little attention to the quantity and quality of

food rations and drinking water. After all, we were doctors and nurses.

In 1980, around one million ethnic Somalis fled conflict in Ethiopia into 35 camps throughout Somalia. After having worked for five years in Ban Nam Yao, I was recruited by the Somali Ministry of Health's Refugee Health Unit (RHU) as the senior medical adviser. This time, I found an opportunity to take a public health approach to a refugee population and apply the concepts of Primary Health Care (launched in Alma Ata two years earlier) to a refugee situation for the first time. Also for the first time, I encountered CDC epidemiologists who conducted population surveys and advised the RHU on establishing an appropriate disease surveillance system.

Refugee community health workers were trained in large numbers, and standardized treatment protocols, information systems, and essential drugs were agreed to by the 20 or more international NGOs working in the camps. In 1981, the RHU developed a manual – Guidelines for Health Care in Refugee Camps in the Somali Democratic Republic – the first such manual of its kind. A large scurvy outbreak occurred in Somali camps, with thousands of cases – the largest documented outbreak of scurvy in the twentieth century.¹ The epidemiology training provided by CDC staff formed the basis of the outbreak investigation.

In 1986, I was awarded a Fogarty Fellowship to do epidemiologic research at CDC, focusing on morbidity and mortality in refugee populations. I discovered that my CDC colleagues in Somalia were members of just the third response by the agency to a refugee crisis. For the subsequent ten years I was privileged to be part of the growth in CDC's capacity to respond to humanitarian emergencies and to the development of epidemiologic methods, tools, and indicators that contributed to the body of knowledge that is the basis of this book. This in turn was part of a global transformation of the health response to humanitarian emergencies from an attitude of "Do the best you

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can...” when I was in Thailand 40 years earlier, to an evidence-based framework supported by comprehensive technical guidelines and minimum standards.

History of CDC Responses to Humanitarian Emergencies

The first example of CDC engagement in a humanitarian crisis was during the Nigeria-Biafra civil war when, at the request of the International Committee of the Red Cross (ICRC), CDC participated in refugee support for two years by providing disease control and nutrition assistance. During this effort, the CDC assisted the diagnosis and treatment of five hundred thousand children who were affected by severe malnutrition. Dr. William H. Foege was CDC’s first epidemiologist in the Biafran effort, and he served from September until November, 1967. He would later serve as CDC director. In all, around two dozen CDC staff were mobilized. Tragically, in 1968, Paul Schnitker became the first and only Epidemic Intelligence Service (EIS) officer to die in the line of duty when his plane crashed en route to Nigeria.

At this time, there were no international guidelines or assessment tools available for humanitarian emergencies, such as the Biafran crisis. Nor had CDC developed specific methodologies for working in these settings. CDC staff applied and adapted the principles and practices of the field epidemiology that the agency had developed in large part to address public health issues and outbreaks in the United States.

More than a decade later, in 1979, hundreds of thousands of Cambodian refugees fled into Eastern Thailand, initially in Sakaeo camp where early mortality rates were extremely high. Then CDC director William Foege accompanied First Lady Rosalynn Carter to the camp, and soon after CDC epidemiologists were deployed. Again, it was the ICRC that requested CDC assistance. CDC established routine surveillance for the first time in a refugee setting, identifying outbreaks of malaria, measles, and meningitis.²

The crude monthly mortality rate in October 1979 in Sakaeo camp was 31.9 per 1000, compared with a baseline in Cambodia of 2.5 per 1000.³ Within seven weeks, mortality rates returned to normal. CDC expanded surveillance to other camps, such as the massive Khao-I-Dang, with a population of greater than 100,000 refugees. In 1983, the data gathered and

analyzed were published in a CDC Monograph – at the time the most comprehensive descriptive epidemiology of a refugee population.⁴

Starting in 1980, CDC sent a number of epidemiologists to Somalia to conduct mortality and nutrition surveys, establish surveillance, train Somali staff in field epidemiology, and contribute to standard operational guidelines. These epidemiologists were embedded within the RHU, described earlier. The large epidemic of scurvy in the Somali refugee camps led to sustained technical advocacy by CDC to ensure that refugees everywhere received food rations containing the full complement of essential nutrients, including vitamin C.

Reinforcing CDC’s Internal Capacity

Starting in 1987, I occupied the sole designated position to support CDC responses to conflict-related emergencies within the Technical Support Division of the International Health Program Office. Further analyses of data from refugee camps in Thailand, Somalia, Sudan, and Ethiopia led to a series of papers on the public health impact of forced displacement.⁵ The first EIS officer was assigned in 1990, and his first mission was to conduct a health needs assessment of Liberian refugees in the Forest Region of Guinea.

In subsequent years, CDC provided epidemiologic assistance in the following settings: Somali refugees in eastern Ethiopia (1989)⁶; internally displaced persons in Southern Sudan (1989); Afghan refugees in Pakistan (1991); and Mozambican refugees in Malawi and Zimbabwe (1990–93), where there were repeated cholera outbreaks and a major outbreak of pellagra in Malawi due to the removal of peanuts, the main source of niacin, from the food ration.⁷

In the aftermath of the First Gulf War in 1991, half a million Iraqis, mainly Kurds, fled to the Turkish border. A number of CDC epidemiologists were attached to the US military in Turkey and Northern Iraq where they helped to establish camp mortality and morbidity surveillance, investigated a cholera outbreak, conducted a mortality and nutrition survey, and liaised with the military on appropriate medical supplies, immunization, management of dehydration, and rehabilitation of health facilities.⁸ Working with the US Office for Foreign Disaster Assistance (OFDA), CDC provided a critical link between the military and civilian NGOs working in the relief program.

Other health needs assessments were conducted in the early 1990s by CDC epidemiologists among Bhutanese refugees in Nepal (1992); Burmese refugees in Bangladesh (1992); Sudanese refugees in western Ethiopia (1992), where there was an outbreak of HIV infection and other sexually transmitted infections; and Somali refugees in Kenya (1992), where there was an outbreak of hepatitis E virus.

And Then ... on December 8, 1991, the Soviet Union Ceased to Exist

By New Year's Day of 1992, CDC epidemiologists had joined a Disaster Assistance and Response Team (DART) assembled by OFDA in Moscow. The assessment was wide-ranging and included food availability, medical facility capacity, and disease surveillance.⁹ For a number of subsequent years, CDC continued to provide surveillance and outbreak investigation assistance in former Soviet republics, including Tajikistan and Armenia.¹⁰

The end of the Cold War and the breakup of the Soviet Union led to instability and conflicts across the globe. The number of armed, intrastate conflicts peaked during these years, reaching a high of 50 in 1992. Millions of Somalis were affected by famine amidst a vicious civil war fought by dozens of militia (1991–92). CDC assigned epidemiologists to UNICEF, where they conducted mortality and nutrition surveys and established surveillance in displaced persons camps.¹¹ This was one of the most dangerous missions ever undertaken by CDC and staff had to be protected by armed local militia called “technicals.”

During 1993, CDC epidemiologists were mobilized through OFDA to the former Yugoslav republics of Serbia, Bosnia and Herzegovina, and Croatia. Public health needs assessments were conducted and disease surveillance established in Sarajevo and several Muslim enclaves in Bosnia along with expert advice on the water supply in Sarajevo.¹² Having witnessed the catastrophic impact of the war on public health, CDC discreetly employed advocacy for a US-led peace process.

Goma: The Big Test

In July 1994, around one million Rwandan refugees crossed a bridge into the small town of Goma in then-Zaire, now the Democratic Republic of Congo. Within days, the CDC director mobilized a dozen epidemiologists, who were attached to UNHCR,

UNICEF, WHO and the International Federation of Red Cross and Red Crescent Societies. A devastating epidemic of cholera struck the refugee population that had dispersed into crowded, unplanned camps with inadequate sanitation and no access to clean water. During one week between July 25 and July 31, almost 30 thousand people died, only 10 percent in health facilities. The cholera outbreak was followed by a lethal outbreak of *shigella dysenteriae* Type 1 and by the end of the month after the arrival of the refugees, around 50 thousand had died. Other challenges included outbreaks of meningococcal meningitis and malaria.¹³

CDC worked with UNHCR, WHO and MSF to establish very basic disease surveillance and conduct population surveys in each of the three largest camps. Instituting outreach and assessing the quality of care was a critical role for CDC epidemiologists. Many aid workers were unfamiliar with oral rehydration; therefore, experts in cholera treatment were brought in from Bangladesh. A CDC epidemiologist intercepted a plane load of donated Gatorade that would have harmed children if used to treat dehydration.

Highlights of CDC Achievements up Until 1995

CDC has earned a reputation for timely, technically sound, and locally relevant assistance to populations affected by complex emergencies and has had a significant influence on what is now normative practice by aid agencies such as MSF in complex emergencies and inspired the formation of specialist agencies, such as Paris-based *Epicentre*.

CDC has made a number of evidence-based recommendations to improve responses to humanitarian emergencies; for example, recommending a two-dose measles vaccination schedule in emergencies (at age 6 months and 9 months), which was adopted by UNHCR and WHO. CDC established a crude mortality rate threshold of one per 10,000 per day as the definition of a public health emergency, a threshold that is still used today. CDC led evidence-based advocacy for a minimum energy content of refugee food rations of 1,900 kilocalories per person per day plus recommended daily allowances of micronutrients. The minimum energy content was later raised to 2,100 kilocalories per day. CDC developed a widely adopted incidence threshold (15 per 100,000 per week for two consecutive weeks) for meningococcal

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meningitis to trigger mass vaccination. Recently developed serological tests were used to investigate an outbreak of hepatitis E among Somali refugees in Kenya.

Public health advocacy by CDC demonstrated to key agencies such as UNHCR and the World Food Programme and major donors the direct association between acute child malnutrition, inadequate food rations, and elevated child mortality. Following a review and analysis of methods used to measure mortality and nutritional status in Somalia in 1993, CDC highlighted the need to standardize methods and measurements in assessments of mortality, morbidity, and nutritional status.¹⁴ CDC reports of inadequate clinical practices, such as rehydration, led to a global effort to develop minimum standards for humanitarian response programs, known as the Sphere Project. In 1992, MMWR published a special issue on recommendations for public health in complex emergencies.¹⁵

By the mid-1990s, compared with the situation in 1979, public health for refugees and internally displaced persons had evolved as a specialist field with its own tools, methods, indicators, policies, manuals, reference materials, and minimum standards. In 1993, CDC embarked on one of the first randomized controlled trials to be done in a refugee setting. Investigations of repeated cholera outbreaks in refugee camps in Malawi showed high rates of intrahousehold transmission. Four hundred Mozambican refugee households were systematically identified and followed over a 4-month period, one-fourth of the households were randomly assigned to exclusively use an improved container for water collection with a narrow neck. Analysis of water samples demonstrated that there was a 69% reduction in the geometric mean of fecal coliform levels in household water and 31% less diarrheal disease ($P = 0.06$) in children under 5 years of age among the group using the improved bucket.

The Legacy

The International Emergency and Refugee Health Branch (IERHB) was created in the late 1990s and was followed by the Emergency Response and Recovery Branch (ERRB) of CDC's Division of Global Health Protection, which has led the development of this book. When I visited CDC in late 2016, more than 20 years after I left the agency, CDC had evolved as a major global actor in the

public health response to humanitarian emergencies. They have included complex, conflict-related emergencies, such as the mass displacement of Syrians, and natural disasters in fragile states, such as the 2010 earthquake and cholera epidemic in Haiti. Led by ERRB, the agency responded to 14 humanitarian emergencies between 2007 and 2016.¹⁶ These responses included 62 discrete activities ranging across all elements of humanitarian assistance, including public health surveillance, epidemic investigation and control, water, sanitation, and hygiene (WASH), mental health, and nutrition, to name but a few.

The scale of CDC responses has continued to grow; for example, in 2016, in its first year of existence, ERRB's Global Rapid Response Team deployed more than two hundred CDC staff members to various humanitarian emergencies. Moreover, collaborations between CDC and a broad range of national and international humanitarian agencies have promoted standardization of approaches across the international humanitarian emergency response community and helped to improve the coordination of responses.

Among the many achievements of IERHB and ERRB, I would highlight the following:

- The first accurate estimate of the maternal mortality ratio in Afghanistan.
- Technical support to the first national measles immunization campaign in Afghanistan after the fall of the Taliban.
- Rapid assessments and surveys in Darfur, Sudan and refugee camps in Chad.
- Support for the Somalia communicable disease reporting surveillance system during a period of famine (2011–2014), designed to optimize early warning of outbreaks, by providing analysis and training; this system identified an outbreak of measles in 2011 and polio in 2013, enabling swift intervention.
- Estimating the prevalence of war-related mental health conditions in post-war Sri Lanka.
- Extensive assistance to Syrian refugees in Jordan, Turkey and Iraq, including needs assessments, surveillance, immunization campaigns, reproductive health, mental health, nutrition, tuberculosis, polio surveillance, cholera epidemic response in Iraq, and the establishment of an Early Warning and Response Network (EWARN) in northern Syria.

I highly commend this volume because I know that it is based on decades of cumulative field experience in almost every major humanitarian emergency in the world. This is the first practical resource dedicated to the topic of health in humanitarian emergencies for use by clinical and public health practitioners, graduate level students, and individuals working for government agencies, international agencies, and NGOs.

The range of topics covered in this book is more comprehensive than any comparable publications, ranging from epidemiology and ethics to WASH and logistics. With CDC and NGO co-authors of each chapter, the content is both rigorously evidence-based and grounded in the practicalities of implementing humanitarian aid programs in complex and challenging settings. It will be a valuable resource in preparing to work in the humanitarian arena and a constant companion in the field. I only wish that I had had a copy when I first arrived in Ban Nam Yao in 1976.

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Notes

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Abbreviations

AIDS – acquired immunodeficiency syndrome	Hib – <i>hemophilus influenzae</i> type b
ALTRI – acute lower respiratory tract infection	HIS – health information system
ARDS – acute respiratory distress syndrome	HIV – human immunodeficiency virus
ARI – acute respiratory infection	hMPV – human metapneumovirus
ASD – acute stress disorder	HRP-2 – histidine rich protein-2
AUTRI – acute upper respiratory tract infection	HSI – hospital safety index
BMI – body mass index	HTH – high test hypochlorite powder
CAR – Central African Republic	IASC – Interagency Standing Committee
CCD – Cultural Concept of Distress	IC – infection control
CDC – US Centers for Disease Control and Prevention	ICF – intensive case finding
CE – complex emergency	IDD – iodine deficiency disorder
CFR – case fatality rate	IDP – internally displaced person
CHE – Complex humanitarian emergency	IEHK – Inter-Agency Emergency Health Kit
CHW – community health worker	IOM – International Organization for Migration
CLTS – community-led total sanitation	IPC – infection prevention control
CMAM – community-based management of acute malnutrition	IPT – isoniazid preventive therapy
CRED – Centre for Research on the Epidemiology of Disasters	IRC – International Rescue Committee
CSB – corn soy blend	IRS – indoor residual spraying
CSF – cerebrospinal fluid	ISDR – International Strategy for Disaster Reduction
DALY – disability-adjusted life years	ISTC – International Standards of Tuberculosis Care
DNA – deoxyribonucleic acid	ITPS – insecticide treated plastic sheeting
DOTS – directly observed therapy-short course	IV – intravenous
DRC – Democratic Republic of Congo	IVM – integrated vector management
DRR – disaster risk reduction	KAP – Knowledge, Attitude, and Practices (survey)
DRR-PSP – disaster risk reduction - private sector partnership	LACCDR – Los Angeles County Community Disaster Resilience
DSM – Diagnostic and Statistical Manual of Mental Disorders	LACDHP – Los Angeles County Public Health Department
Eco-san – ecological sanitation	LLINS – long-lasting insecticidal nets
EM-DAT – Emergency Events Database	LMICs – low- to middle-income countries
EPI – Expanded Program on Immunization	LNS – lipid-based nutrition supplements
EWARN – early warning and response network	LRTI – lower respiratory tract infection
FBC – full blood count	LTBI – latent Mycobacterium tuberculosis infection
FBF – fortified blended food	MDD – micronutrient deficiency disease
FCR – free chlorine residual	MDGs – Millennium Development Goals
FDA – Food and Drug Administration	MDR – multidrug resistant
HFA – Hyogo Framework for Action	MDS – Minimum data set
	MERS – Middle East respiratory syndrome
	mhGap – Mental Health Gap Action Programme
	MHPS – mental health and psychosocial
	MNP – micronutrient powders

List of Abbreviations

MOH – Ministry of Health	RDT – rapid diagnostic test
MoHCDGEC – Ministry of Health, Community Development, Gender, Elderly and Children of Tanzania	ReSoMal – rehydration solution for malnutrition
MSF – Médecins Sans Frontières	RSV – respiratory syncytial virus
NaDCC – sodium dichloroisocyanurate	RUFs – ready-to-use foods
NCDs – noncommunicable diseases	RUSF – ready-to-use supplementary food
NFI – nonfood item	RUTF – ready-to-use therapeutic food
NGO – nongovernmental organizations	SALT algorithm – Sort, Assess, Lifesaving therapy, Transport
NIMS – National Incident Management System	SARS – severe acute respiratory syndrome
NP – nasopharyngeal	SC – stabilization center
NTP – National Tuberculosis Program	SFP – supplementary feeding program
NTU – nephelometric turbidity units	SODIS – solar disinfection
OCT – outbreak control team	STEPS – WHO STEPwise Approach to Surveillance
OCHA – United Nations Office of the Coordination of Humanitarian Affairs	TB – tuberculosis
ODI – Overseas Development Institute	TDS – total dissolved solids
ODS – Optional data set	tSFP – targeted supplementary feeding program
OP – oropharyngeal	UDDT – urine-diversion dry toilet
ORS – oral rehydration solution	UN – United Nations
OTP – outpatient therapeutic program	UNHCR – Office of the United Nations High Commissioner for Refugees
PEN – package of essential noncommunicable	UNICEF – United Nations Children’s Fund
PET – polyethylene terephthalate	UNISDR – United Nations International Strategy for Disaster Reduction
PHAST – participatory hygiene and sanitation transformation	UNRRA – United Nations Relief and Rehabilitation Administration
pLDH – plasmodium lactate dehydrogenase	UNRWA – United Nations Relief and Works Agency
PLHIV – persons living with HIV/AIDS	URTI – upper respiratory tract infection
PLW – pregnant and lactating women	USD – US Dollars
PoU – point-of-use	VIP – ventilated-improved pit
PCR – polymerase chain reaction	WASH – water, sanitation, and hygiene
PFA – psychological first aid	WFP – World Food Programme
PHO – public health officer	WHO – World Health Organization
PTSD – posttraumatic stress disorder	WHOPES – WHO Pesticide Evaluation Scheme