Working Paper

Population-Related Crises: A Typology

Gerhard K. Heilig

WP-92-58
August 1992

International Institute for Applied Systems Analysis □ A-2361 Laxenburg Austria
Telephone: +43 2236 715210 □ Telex: 079137 iiasa a □ Telefax: +43 2236 71313

Population-Related Crises: A Typology

Gerhard K. Heilig

WP-92-58
August 1992

International Institute for Applied Systems Analysis □ A-2361 Laxenburg Austria

Telephone: +43 2236 715210 □ Telex: 079137 iiasa a □ Telefax: +43 2236 71313

ABSTRACT

The paper deals with demographic aspects of various crises. In particular it reviews available but scattered information on the death toll of selected famines, epidemics, (civil) wars, genocides, ecological crises, and other catastrophes.

Its main objective is to put things into perspective. First, the paper demonstrates that aggregate statistics are usually inadequate to study the demographic impact of crises. There were crises in history that killed millions of people - such as the "Great Leap Forward" in China - and yet are hardly discernable on a line graph showing the country's overall population growth. Second, in recent history, life and well being of people was usually endangered by *intentional* human action such as war, political terror, and genocide - not by natural disasters or ecological crises. And third, there is evidence that certain lifestyles (such as cigarette smoking) and social patterns (such as frequent change of sexual partners) can increase the morbidity and mortality of a population much more than anything else (with exception of a nuclear war). It is not the consequences of dramatic crises, but slow killers (cigarettes and AIDS) which have the most serious demographic impact.

The paper (indirectly) also raises a principal question: Is it not rather cynical and detached from reality to concentrate enormous intellectual and financial resources on the study of possible environmental crises at a time when

- several hundred million people worldwide are suffering severe malnutrition;
- famines (triggered by civil wars) are presently killing or injuring half of the population of Somalia and Sudan (one-fourth (!) of the children under 5 have already died during the last few months);
- an estimated 10 million people worldwide are infected with a deadly virus, and another 20 to 30 million will most likely be infected by the year 2000;
- millions are tortured by terror regimes in many countries;
- and bloody civil wars are flaring up all over the world, killing, wounding and displacing hundreds of thousands of innocent people?

While the demographic impact of these events is *significant* and *obvious*, the consequences of environmental crises are either hypothetical, in the distant future, or relatively minor.

TABLE OF CONTENTS

POPULATION-RELATED CRISES: A TYPOLOGY

Gerhard K. Heilig

INTRODUCTION

Crises are a constituency of our existence. Sometimes they affect a whole political system, sometimes a small group or an individual, in a few cases they might endanger the existence of mankind. This paper deals with demographic causes and consequences of crises. Its main objective is to review available, but scattered, information on some of the most serious population-related catastrophes. The paper also includes a typology that classifies the various events. Finally, problems related to the identification of demographic causes and consequences of crises are discussed. In general, the paper tries to increase awareness of the broad spectrum of traumatic events that can affect a population.

For our purpose we pragmatically define crises as social, economic, political, natural, or demographic events that come *unexpected* (even if predicted),[1] *evolve rapidly* over a short period of time and are *difficult or impossible to influence.* They suddenly change the internal structure of a phenomenon or turn around its long-term trends. This definition of crisis might be not very precise or consistent. However, in the course of our discussion, we will use examples to specify its meaning.

To start with, we will distinguish the following types of population-related crises:

- Famines
- Epidemics
- Wars
- Genocides
- Systematic terror and suppression
- Massive displacement and forced migration of peoples
- Ecological catastrophes
- Epochal change through multiple crises

---

[1] History is full of crises that were well predicted, but still came unexpected to the public, because nobody really trusted the prediction. (Greek mythology, by the way, seems to have a special favor for this kind of tragic.) Scientists sometimes believe that publishing a doomsday projection or model scenario is sufficient to make the public aware of a looming disaster. But this is just scientific hypocrisy. There were too many false predictions, contradictory projections and irrelevant scenarios from social scientists (including economists and demographers) that the public would take their models too serious. This could be called the *"five minutes after 12"* problem: a crisis has to be well under way, before the public - including politicians - would accept that the (scientific) predictions were *right.*

1. FAMINES

The classical case of a population-related crisis is famine. For thousands of years, well up to early modern societies, famines were an integral part of the human existence.[2] In traditional societies the food supply heavily depended on regional agriculture. Trade was difficult, expensive and usually restricted to local (or regional) markets. Crop failure due to pests, livestock diseases, or bad weather were quite frequent and a succession of a few bad harvests could easily drench available stocks.

There is some discussion if famines were the primary cause of population stagnation in the past - an argument that Malthus made prominent. Based on simulation experiments Watkins and Menken have argued that the demographic effects of severe famines both in ancient Europe and Asia were quite fleeting: "90 years after the famine, the population is...only 7 percent smaller than it would be had there been no famine".[3] There is, however, considerable disagreement. Komlos, for instance, provides evidence that in early-modern England, population trends were greatly influenced by "localized demographic crises, which in turn were related to general agricultural conditions".[4]

Well known is the Great Irish Famine (1846-1851). Its precise demographic impact might be difficult to quantify,[5] but there can be no doubt that it caused a considerable increase of mortality and triggered a wave of emigration. Not too long ago India was notorious in its succession of serious famines. Only since the "Green Revolution" has the country acquired self-sufficiency in food.[6] While India's history of famines caused widespread human suffering, it did not stop its high population growth and it did not significantly distort its age structure (at least on a national level).

In recent history a most serious case of mass starvation occurred during the "Great Leap Forward" in China between 1959 and 1962.[7] It probably generated the single largest loss of human life ever outside of war. Within a few months some 23 million (!) Chinese starved to death or were killed by famine-related diseases; another 20 to 30 million suffered severe malnutrition and were physically harmed for the rest of their life. The full magnitude of the disaster was covered up by the communist government for nearly 20

---

[2] Walter, J. and R. Schofield, Eds. 1989. *Famine, Disease and the Social Order in Early Modern Society.* Cambridge: Cambridge University Press.

[3] Watkins, S.C. and J. Menken. 1985. Famines in historical perspective. *Population and Development Review* 11(4):647-675.

[4] Komlos, J. 1988. On the role of crises in historical perspective. *Population and Development Review* 14(1):159-164.

[5] Boyle, P.P. and C. O Grada. 1986. Fertility trends, excess mortality, and the Great Irish Famine. *Demography* 23:543-562.

[6] Widespread undernutrition still prevails in India, but serious famines have become rare.

[7] Piazza, A. 1983. Trends in Food and Nutrient Availability in China, 1950-81. World Bank Staff Working Paper, No. 607. Washington, D.C.

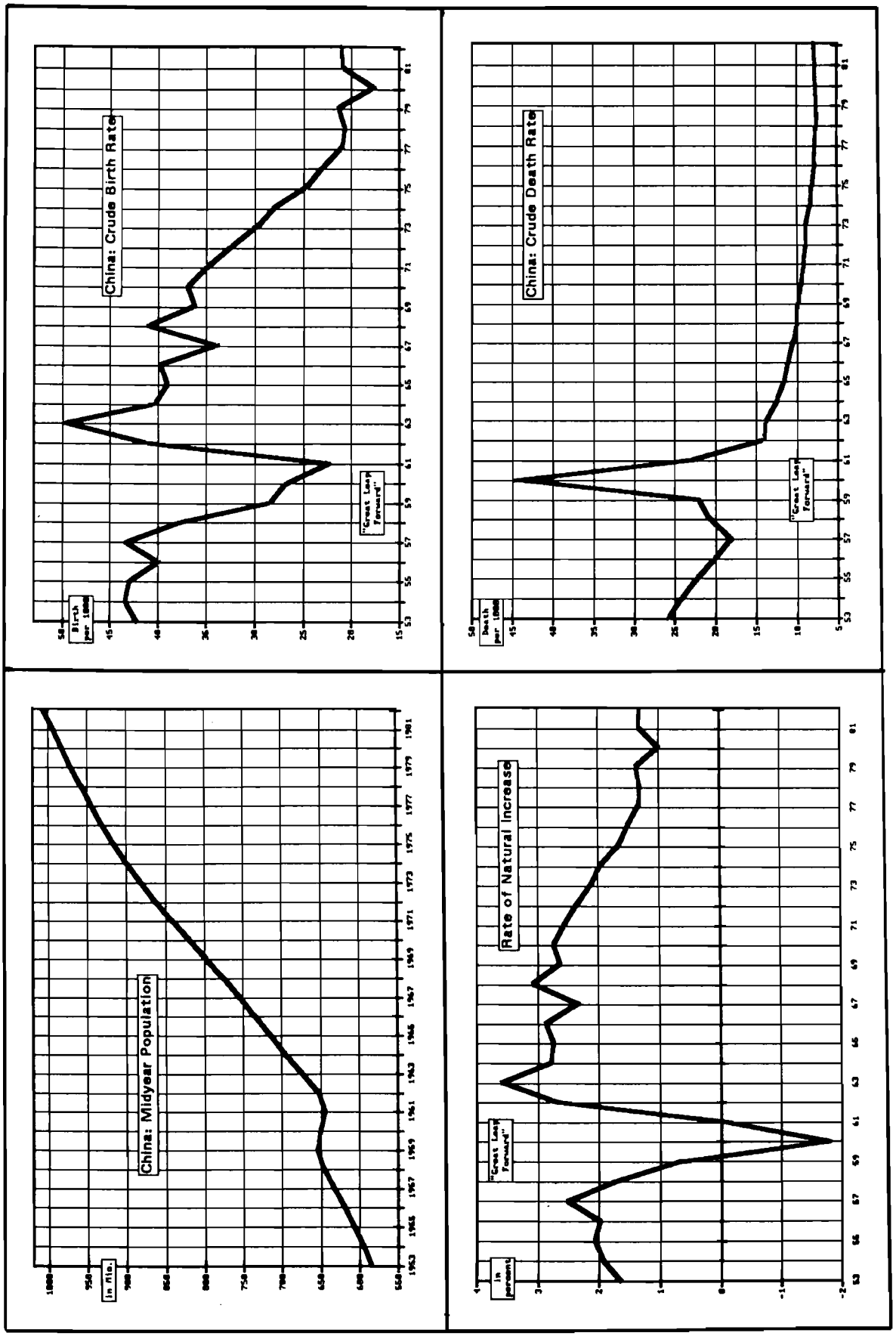

Figure 1. Various demographic measures, China, 1953-1982.

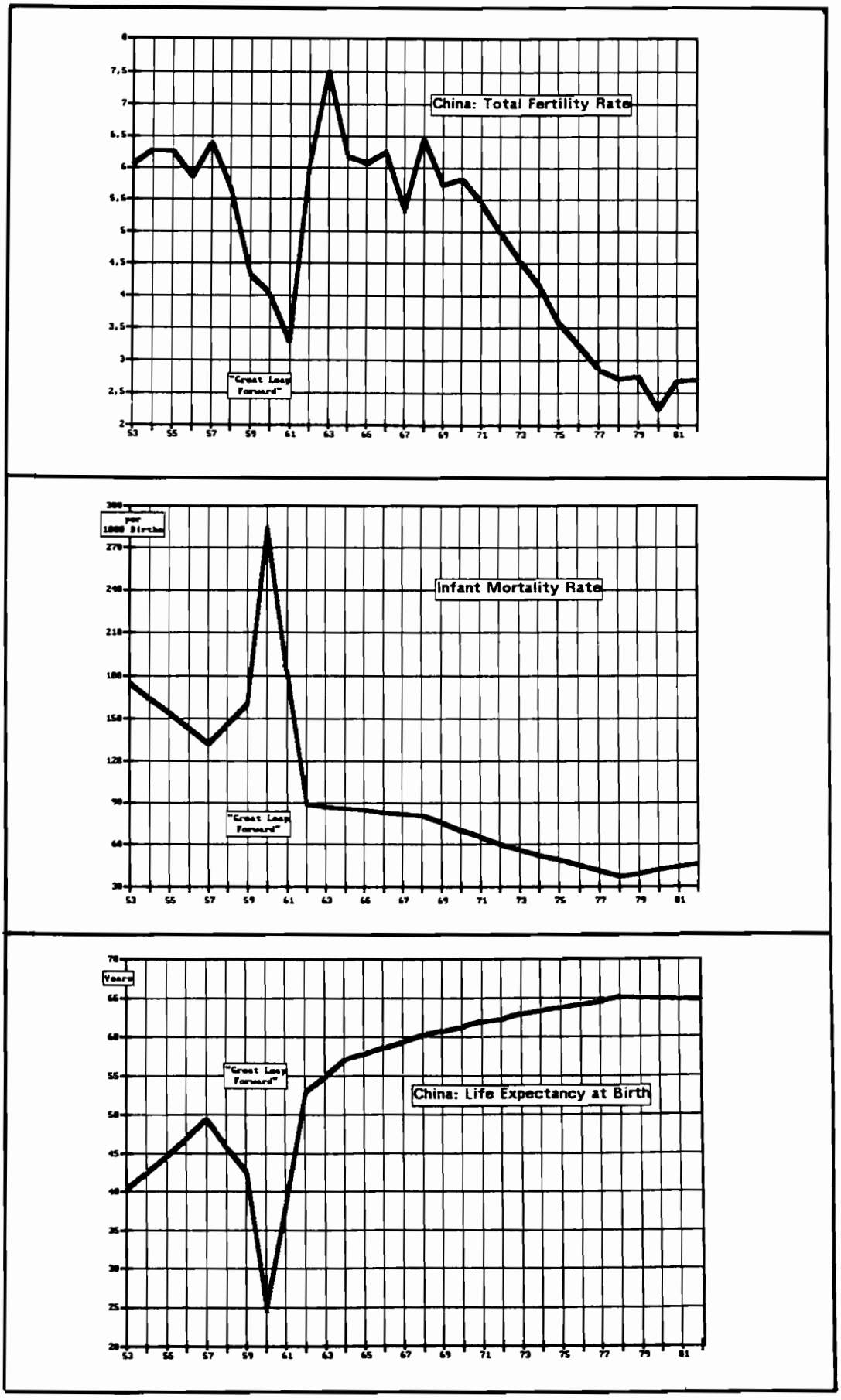

Figure 2. Various demographic measures, China, 1953-1982.

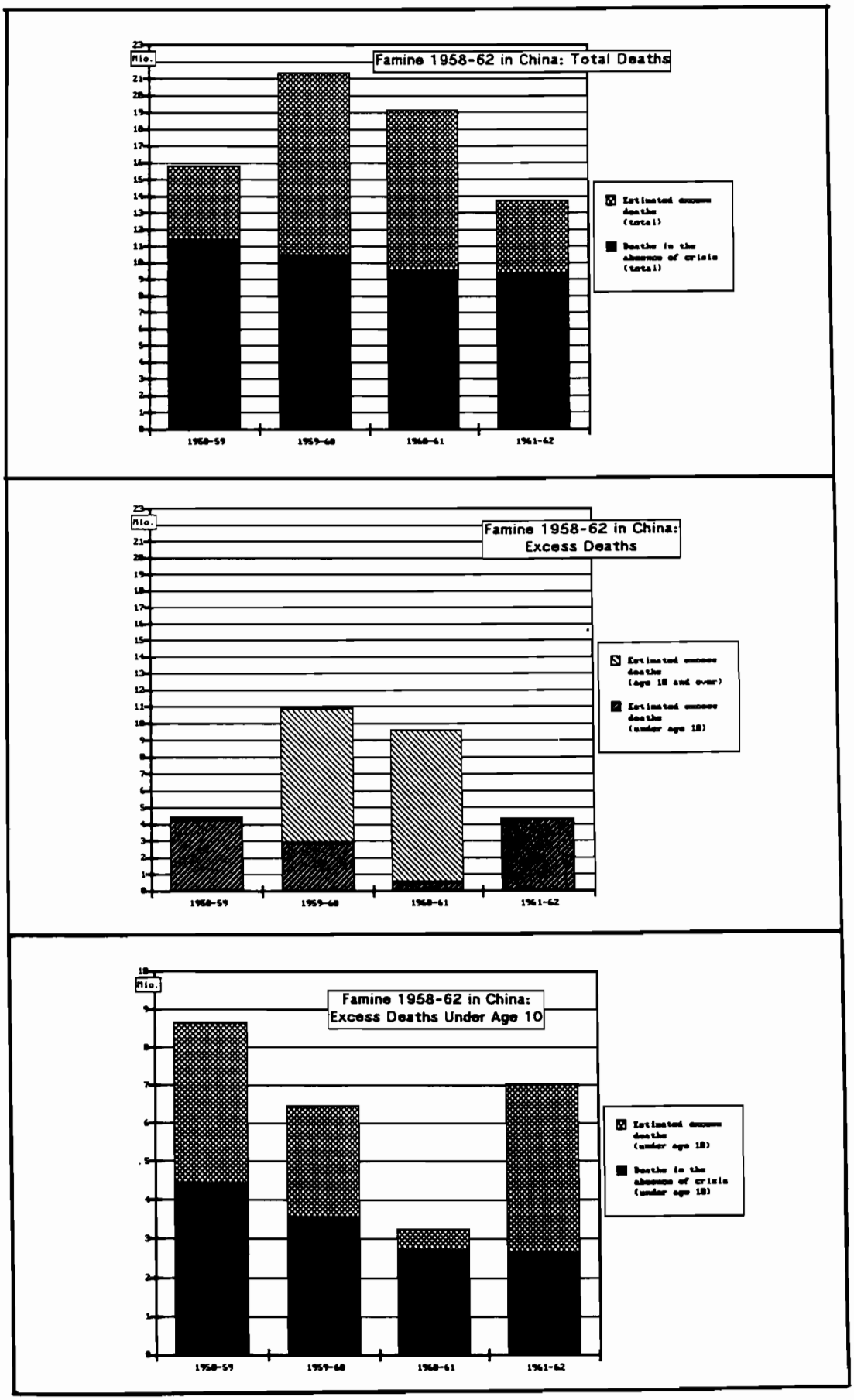

Figure 3. China, excess deaths during the "Great Leap Forward". Source: Ashton et al. (1984), p. 619.

years. The demographic consequences, however, were so severe, that demographers could uncover the truth some 20 years later on the basis of the 1980 census data.[8] Today there is still a clearly visible cut in the age structure of the Chinese population, which represents the birth deficit and the steep increase in infant mortality during the years of the famine (see Figures 1 and 2). Judith Banister's careful reconstruction of the Great Leap's demographic impact shows that Crude Birth Rate and Infant Mortality Rate more than doubled (from 20 to 45 per 1000 of the population and from 130 to 284 per 1000 births, respectively). The Total Fertility Rate, which was 6.3 before the Great Leap Forward, declined to 3.3 in 1961. However, despite this truly dramatic short-term demographic consequence, not much was changed in the long run. There was only a slight decline in population (see Figure 3), and the fertility and mortality quickly adjusted to pre-famine level. The Total Fertility Rate, for instance, quickly rose to 7.5 after the famine years.[9]

2. EPIDEMICS

The Great Plague during 14th century Europe has become synonymous with the death toll of infectious disease. According to estimates roughly one-third of the European population was eradicated by subsequent outbreaks of the disease and the famines that followed. Between 1340 and 1450 the population declined in Germany from 11.5 to 7.5 million, in France and the Netherlands from 19.0 to 12.0 million and in Italy from 10.0 to 7.5 million.[10] The (urban) depopulation lowered the demand for food; the prices began to fall, and this in turn triggered agricultural stagnation that lasted for many decades. Subsequently, famines flared up and killed many survivors of the plague. It was estimated that the famine-related mortality was in fact higher than that of the plague.

Only a few years ago we were reminded that worldwide plagues are not problems of the past. The Human Immunodeficiency Virus (HIV) which is the causal agent of the Acquired Immunodeficiency Syndrome (AIDS) has swapped across most parts of the world with alarming speed. Some 160 countries have reported AIDS cases to the World Health Organization. As of summer 1991 more than 350,000 cases of AIDS were registered officially. However, the WHO has estimated that actually more than one million adult AIDS cases may have occurred worldwide since the beginning of the epidemic.[11] According to recent estimates some 10 million people worldwide could be infected with HIV.[12] So far, HIV-infected women have given birth to some 3 million

---

[8] Banister, J. and S.H. Preston. 1981. Mortality in China. *Population and Development Review* 7(1):98-110.

[9] Ashton, B., K. Hill, A. Piazza, and R. Zeitz. 1984. Famine in China, 1985-61. *Population and Development Review* 10(4):613-645.

[10] *Der Grosse Plötz*. Auszug aus der Geschichte. 30th Edition. Wurzburg, pp. 495, 514.

[11] World Health Organization. 1991. In Point of Fact, No. 74 (May).

[12] Placa, J. 1991. The Sobering Geography of AIDS. *Science* 252:372-373.

children: In almost 1 million cases the virus was transmitted from mother to child. Some 50% of these HIV-infected children have already developed AIDS or have died from the disease. The other 2 million non-infected children will inevitably become (half-) orphans when their mothers die of AIDS. The WHO has estimated that 10-15 million children, mostly in sub-Saharan Africa, will lose their mothers to the epidemic.[13] No one knows how many will be infected before a vaccine or causal therapy is found, but estimates for the year 2000 range in the order of 30-40 million.[14]

The AIDS epidemic is an excellent example of a population-related crisis. (a) It came totally unexpected: the epidemic was well under way when an ordinary family physician in Los Angeles observed a suspicious cumulation in Kaposi-Sarcomas (which is a final stage of the AIDS disease) among his homosexual patients. (b) Not much could be done to stop the crisis in the short run, since hundreds of thousands were already infected before they even knew about the virus. (c) The speed of the crisis was breathtaking: within a few months it was disseminated to some 160 countries around the world. And (d), the possible demographic consequences are obvious: AIDS patients die quickly. More than 50% are dead only 1 year after the disease is diagnosed. Since HIV-infected mothers can transmit the virus to their unborn child, the epidemic has a direct impact on infant mortality. According to recent estimates AIDS could double infant mortality rates in the most seriously affected African areas.

There were intense efforts to quantify the demographic impact of AIDS.[15] Only recently the UN Department of International and Social Affairs in collaboration with the World Health Organization published the proceedings of a workshop on this topic.[16] A broad range of mathematical modeling techniques was used to project the spread of HIV and to estimate AIDS-related mortality. The brochure, filled with sophisticated mathematics, can be boiled down to the result, that the spread of HIV (and consequently AIDS) depends on the patterns and trends of sexual behavior. These, however, are poorly understood, difficult to model, and nearly impossible to predict. They vary enormously - not only between countries and ethnic groups, but also between generations, social classes, or within the life cycle of individuals. In addition, there are several other difficulties: (a) much uncertainty still exists on the proportion of HIV infected persons who will ultimately develop AIDS[17]; (b) there is an enormous variation in the

---

[13] World Health Organization. 1991. Press release. WHO:UN 75 (15 October). WHO Press.

[14] World Health Organization, cited from *The Economist*, February 29th, 1992, p. 65.

[15] Bongaarts, J. 1988. Modeling the Spread of HIV and the Demographic Impact of AIDS in Africa. Working Paper No. 140. New York: The Population Council.

[16] United Nations/World Health Organization. 1991. *The AIDS Epidemic and its Demographic Consequences.* Proceedings of the United Nations/World Health Organization Workshop on Modelling the Demographic Impact of the AIDS Epidemic in Pattern II Countries: Progress to Date and Policies for the Future, 13-15 December 1989. New York.

[17] There is quite a number of individuals that have not developed AIDS despite the fact that they are HIV infected for 10 or more years. It is still possible that a small number of persons might not develop the disease.

progression rates of the disease - some patients develop AIDS shortly after infection, some have the first symptoms after 10 or more years; (c) the role of co-factors that facilitate HIV transmission or the progression of AIDS is poorly understood; and (d) there is a huge variation in infectivity per contact - persons became HIV infected from one single contact, while others did not contract the virus despite hundreds of sexual contacts with an HIV infected partner.

Table 1. Modeling the demographic consequences of AIDS: selected models (all models were based on the same base population of 100,000 and used a standard set of input values. The table presents the modeling results for a projection period of 25 years).

Model Builder	Scenario	HIV Prevalence (percentages)	Cumulative AIDS Deaths (per 1000)	Population (in thousands)	Rate of Population Change (percentages)
Auvert	Best	0	0	464	3.0
	Intermediate	31.0	200	26	0.5
	Worst	55.0	220	16	-2.0
Brouard	Best	0.2	..	47	3.3
	Intermediate	15.0	..	46	2.4
	Worst	55.0	..	34	0.16
Bulatao	Best	0.3	..	49	3.0
	Intermediate	39.5	..	49	2.5
	Worst	57.5	..	32	2.4
Dietz	Best	0	0	40	3.2
	Intermediate	21.2	63	35	1.5
	Worst	43.9	174	10	-0.7
Interagency Working Group	Best	0	7	32	2.9
	Intermediate	3.5	199	38	2.6
	Worst	42.4	214	25	-2.5
Palloni	Best	0.1	0	46	3.1
	Intermediate	2.8	26	47	2.8
	Worst	30.3	154	20	-0.0

Source: United Nations/World Health Organization. 1991. *The AIDS Epidemic and its Demographic Consequences.* Proceedings of the United Nations/World Health Organization Workshop on Modeling the Demographic Impact of the AIDS Epidemic in Pattern II Countries: Progress to Date and Policies for the Future, 13-15 December 1989. New York.

Given the lack of essential information the modeling exercise in the AIDS workshop can be seen as a demonstration of ignorance - albeit on a (technically) very high level. Table 1 shows the results of six different models to project the demographic consequences of AIDS for a hypothetical population. All models were fed with an identical set of input

data and scenario assumptions.[18] However, the results are bizarre: in the intermediate scenario life expectancy is projected to decline from 53 years for females and 50 for males to an average of 26, 47, 36, 28, or 42 years - according to model. In one model (Auvert) projected life expectancy ranges from 60 (best scenario) to 16 (!) years (worst scenario). The projected size of the population varies between 470,000 (best scenario of the "Dietz" model) to 120,000 (worst scenario of the "Dietz" model). The cumulative number of AIDS cases per 1000 of the population ranges from 0 (best scenarios) to 500 (Bulatao). According to the intermediate variant - which was designed as a best guess scenario - the projected cumulative number of AIDS deaths varies between 26 and 200 per 1000 of the population; and the projected population ranges from 236,000 to 427,000. In other words: the AIDS epidemic may or may not have significant demographic consequences.

This meager result of modeling, however, is not untypical in the case of a real crisis. Actually, we could define a crisis as an event, where we lack essential information to predict its further course and outcome. We are blind for some time, before the developing crisis produces additional empirical evidence.

3. WARS

Loss of human life due to war is probably as old as famine-related mortality. However, in prehistoric times people lived scattered across empty lands in small tribes, and it was rather difficult to eradicate very large numbers. The brutal wars of the Middle Ages were also only local or regional in scope (even if they moved across far distances, such as the Crusades) - they never eliminated the population of whole nations. Only since the industrial revolution do we have the capacity to destroy very large areas and kill millions. The mechanization of war expanded the scope of destruction to whole continents. Far reaching weapons (mortars) and means of mass extermination (bombs, lethal gas) made it possible to eliminate whole armies.

This opportunity was put to a first horrible test on the battle fields of World War I (1914-1918).[19] In the beginning too many leaders thought the war would be only some kind of tough sports game for dominance in Europe. There were too many nationalist war-mongers all over Europe; and too many young men had proudly volunteered to fight for their nation. Only a few intellectuals had warned the public of the looming disaster. It ended in the hell of Verdun. Within 10 months (from February 21 to December 16, 1916) some 360,000 French and 335,000 German soldiers lost their lives on this battle

[18] It was a standard population of 100,000 men and 100,000 women. Current life expectancy at birth was assumed according to the North Model of the Coale-Demeny life-table system with 53 years (female) and 50 years (male). Within 25 years an increase in life expectancy (in the absence of AIDS) to 63 (female) and 60 years (male) was assumed. For details of the input parameters see: United Nations/World Health Organization, *op. cit.*, pp. 5-16.

[19] Falls, C. 1959. *The Great War.* New York: Putnam.

field alone. Altogether World War I caused some 6.3 million military casualties; some 19.5 million soldiers were wounded.[20]

The crisis of World War I did not come unexpectedly. Everyone could see the disaster. However, like small children playing with fire, the Europeans had been attracted by the danger. It should have been a bitter lesson, but they refused to learn. Only a generation later some 40 million soldiers lost their lives on the battle fields of World War II (1939-1945).[21] In addition some 15 million civilians were killed.[22] Altogether some 55 million died due to military actions in World War II.[23] As a consequence of the war several millions were expelled from their country. The demographic landscape of Europe was reshaped.

Since the day when the first (and only) two nuclear weapons were used in wartime to destroy Hiroshima and Nagasaki, our world has changed fundamentally. We now have the capacity not only to kill millions, we actually can eradicate the human race (or at least bomb it back into a pre-cultural state of scattered tribes). The potential demographic effect of nuclear bombs is beyond our imagination. One minute (!) after "Enola Gay" (as the pilot called his deadly load) was dropped by the B-29 bomber over Hiroshima, 60,000 people were dead or dying in the city.[24] The total loss of human life due to this single explosion was between 200,000 and 300,000. It was a "baby bomb" as compared to present-day nuclear potential.

In 1983 a committee of experts chaired by S. Bergström submitted a report to the World Health Organization on the "Effects of Nuclear War on Health and Health Services". It

---

[20] Including losses among soldiers from Germany, France, Great Britain, Italy, Austria-Hungary, Russia, Turkey, and the USA. See: *Der Grosse Plötz, op.cit.*, p. 848.

[21] Michel, H. 1974. *World War II.* Gordon-Cremonesi.

[22] Estimates of civilian and military losses during World War II vary considerably. In 1970 Dupuy and Dupuy estimated that the total military losses of World War II were in the order of 15 million, while the civilian dead ranged from 26 to 34 million (including approximately 6 million Jews of Germany and occupied European nations). See Dupuy, R.E. and R.N. Dupuy. 1970. From 3500 B.C. to the present. *The Encyclopedia of Military History.* Macdonald and Janes, p. 1027. According to other sources about 50% of the 52 million overall casualties were civilian. A more recent source from 1987 *(Der Grosse Plötz),* however, probably overestimates the number of military losses, since its figures for the Soviet military casualties are based on official statistics (which are frequently considered as too large).

[23] This includes military and civilian losses due to military action of following nationalities: Germany, Soviet Union, USA, Great Britain, France, Poland, Italy, Romania, Hungary, Yugoslavia, Finland, Norway, Denmark, Bulgaria, Greece, Belgium, the Netherlands, and Japan. *Der Grosse Plötz, op. cit.*

[24] Kennedy, E. and M. Hatfield. 1982. Die Überlebenden werden die Toten beneiden. Die Auswirkungen eines Atomschlags (The survivors will envy the dead. The effects of an atomic attack). *Der Spiegel* 17:149-170 (in German).

concluded that "nuclear weapons constitute the greatest immediate threat to the health and welfare of mankind".[25]

Table 2. Deaths of major armed conflicts in 1990.

Location	Warring parties	Total Number of Deaths During Specified Period	Number of Deaths in 1990
United Kingdom/Northern Ireland	British Govt./IRA	1969-1990: 2,800	74
Iran	Iranian Govt.	1979-90: 17,000	< 50
Iraq	Iraqi Govt./Kurds	1980-1989: 5,000-6,000	..
Israel/Palestine	Israeli Govt./PLO	1948-1990: > 11,000	560
Lebanon	Lebanese Govt., Various Guerrilla Groups	1975-1990: 150,000	> 2,350
Turkey	Turkish Govt./Kurds	1984-1990: 2,000-2,500	> 360
Afghanistan	Afghan Govt./Mujahideen	1978-1990: 1,000,000	..
Bangladesh	Bangladesh Govt./Guerrilla	1975-1990: 1,200-3,000	< 100
India	Indian Govt./Various Guerrilla Groups	1983-1990: 19,800	> 3,800
India-Pakistan	Indian Govt./Pakistan Govt.	1971: 11,000; 1982-1990: < 600	< 100
Myanmar (Burma)	Myanmar Govt./Various Guerrilla Groups	1948-1951: 8,000 1950: 5,000 1981-1984: 400-600 yearly 1985-1987: > 1,000 yearly 1988: 500-3,000	..
Sri Lanka	Sri Lankan Govt./Various Guerrilla Groups	1983-1990: 500-20,000	3,500-4,000
Cambodia	Cambodian Govt./Various Guerrilla Groups	1979-1989: > 25,000	..
Indonesia	Indonesian Govt./Various Guerrilla Groups	1975-1990: 15,000-16,000	..
Philippines	Philippine Govt./Various Guerrilla Groups	1972-1990: > 37,000	< 400
Angola	Angolan Govt./UNITA, FLEC, FNLA Guerrilla	1975-1989: 25,600	..
Chad	Chad (Habré) Govt./Various Guerrilla Groups	1965-1990: 33,000	5,800
Ethiopia	Ethiopian Govt./Various Guerrilla Groups	1962-1990: 500,000	> 10,000
Liberia	Liberian (Doe) Govt./Various Groups	1989-1990: 10,000-13,000	..
Morocco/Western Sahara	Moroccan Govt./Polisario	1975-1989: 10,000-13,000	..
Mozambique	Mozambique (Frelimo) Govt./Zimbabwe Govt. /MNR Guerrilla	1985-1989: 7,000-9,000 (mill.) 100,000 (civ.)	..
Somalia	Somalia Govt./Various Guerrilla Groups	1981-1990: 50,000-60,000	> 1,000
South Africa	South African Govt./ANC /Inkartha/White Rightist Groups	1984-1990: 7,750	> 3,400
Sudan	Sudanese Govt./Guerrilla Groups/military factions	1983-1990: 33,000 (mill.)	1,000 (est. mill.)
Uganda	Uganda (NRM) Govt./Various Guerrilla Groups	1986-1990: > 11,000 (mill.)	..
Colombia	Colombian Govt./Various Guerrilla Groups	1980-1990: > 8,500	1,000
El Salvador	Salvador Govt./MFLN	1979-1990: 76,000	1,500-2,000
Guatemala	Guatemalan Govt./URNG Guerrilla	1962-1990: 20,000-60,000	< 500
Nicaragua	Nicaraguan Govt./Contras	1981-1990: > 30,000 (mill.)	< 100 (mill.)
Peru	Peruvian Govt./Sendero Luminoso/MRTA Guerrilla	1981-1990: 11,500-20,000	3,400

Source: Compiled by the author from: Stockholm International Peace Research Institute. 1991. World armaments and disarmament. Pages 351-380 in *SIPRI Yearbook 1991.* Oxford: Oxford University Press.

[25] Cited from: On the demographic impact of nuclear war. *Population and Development Review* 9(3):562-568.

The committee estimated that in the worst case some 2.2 billion people would be immediate victims of a nuclear war; some 1.1 billion would be killed; about the same number would be injured. This catastrophe would not only change demographic structures and trends, it would destroy the fabric of civilization itself.[26]

The possibility of mass extermination in a nuclear war, however, should not distract our attention from demographic consequences of present-day conflicts. It was estimated that some 50 million people have lost their lives on conventional battle fields with "local" or "regional" scope all over the world since the end of World War II. Vietnam, Angola, Mozambique, Afghanistan, Chad, and Ethiopia are only a few key words in this sad row of crises. Only during the year 1990 at least 39,000 people lost their lives in armed combat around the world.[27]

Although casualties of wars numbered in hundreds of millions in our century alone, the direct influence on global population trends has been remarkably modest. If we would chart twentieth century population growth, the war-related excess mortality would hardly be discernible on the graph. Global population growth, however, is a bad indicator of demographic consequences. The age and sex structures of the populations that were affected by World Wars I and II are still heavily distorted, and regional conflicts cut deep scars in the population structures of Vietnam, Ethiopia, Afghanistan, Angola, or Mozambique - to name just a few (see Table 2).

4. GENOCIDES

The two examples of crises in this category cannot be compared to each other. Each one is a tragedy by itself, caused by different factors, propelled by different ideologies and executed with different means. They have only one aspect in common (and that is why we discuss them together): in the end a significant proportion of people were killed *indiscriminately* - men, women and children alike. I am talking about the holocaust of the Jews, and the mass killings of Cambodia's Khmer Rouge death squads.

The Nazis systematically tried to eradicate the Jewish population not only within the Third Reich, but even more so in those territories that were occupied during the war. Millions (especially from Poland) ended their lives in the gas chambers of Chelmno, Belzec, Sobibor, Auschwitz-Birkenau, Maidanek, and Treblinka. The planned genocide ("Endlösung") that began in the spring of 1942 and ended in October 1944, was not due to the turmoils of war; and it was not due to a violent conflict between two ethnic groups. Many German Jews were proud of their country (which was, of course a different one than the Nazis were about to build); it was not rare that Jewish men still wore their "Iron Cross" which they had earned fighting for Germany in World War I when their fanatic countrymen marched them to the trains for the concentration camps. The holocaust was

---

[26] Velikov, Y. 1985. *The Night After. Climatic and Biological Consequences of a Nuclear War.* Moscow: Mir Publishers.

[27] Stockholm International Peace Research Institute. 1991. World armaments and disarmament. Pages 351-380 in *SIPRI Yearbook 1991.* Oxford: Oxford University Press.

prepared for many years by spreading the racist ideology of "inferior men"; it was decided at the "Wannsee Conference", meticulously planned by bureaucrats and executed with deadly efficiency. The exact numbers will never be known, but according to detailed estimates up to 5.7 million Jews were killed - 2.35 million only from Poland. It was certainly a most fundamental crisis for the Jewish people - with multiple demographic, social, economic and political consequences. The immediate death toll was enormous. After the war one could hardly find a Jewish family that had not lost several of its members in the gas chambers of Nazi Germany. In many hundreds of thousands of cases whole Jewish neighborhoods were eradicated; often only one single person of a large family network survived.

In addition to the planned genocide of at least 160,000 German Jews, forced migration also decimated the Jewish population in Germany. Hundreds of thousands escaped the concentration camps only by leaving the country. Before the Nazis came to power some 450,000 Jews lived in Germany; today it is only 45,000. In Berlin, where nearly 200,000 Jews lived before the Nazi regime, only 10,000 live today.[28] Social and individual trauma of unprecedented scope were associated with this demographic catastrophe.

It was also ideology, fanaticism and a total disrespect of human dignity that played a major role in the eradication of a significant proportion of Cambodia's population during the Pol Pot regime[29] (see Figure 4). The Khmer resistance movement, which was the agent of the crisis, was spearheaded by a group of intellectuals formed in France. For years these radical Pol Pot leaders had theorized at West European universities about "de-urbanization", "rural development" and the creation of a "new, truly communist people".[30] They intended to conduct a social experiment of unprecedented scope. Khieu Samphan, later one of the leaders of the Khmer Rouge, published his Ph.D. thesis in Paris. It was a crude Marxist analysis of Cambodia's economy and included most of the doctrines that (indirectly) legitimized the later atrocities.[31]

---

[28] See a report on the German Jewish Community in Berlin: Fisher, M. 1992. Berlin Jewish show stirs deeper debate. *International Herald Tribune,* March 6, p. 18.

[29] Barnett, A., B. Kiernan, and C. Boua. 1985. The bureaucracy of death: documents from inside Pol Pot's torture machine. *New Statesman,* May 2, London; see also: Abrams, F. and D. Orentlicher. 1985. Kampuchea: After the Worst. A report on current violation of human rights, August. New York, Washington D.C.: Lawyers Committee for Human Rights.

[30] Samphan, K. 1979. *Cambodia's Economy and Industrial Development.* Ithaca, New York: Department of Asian Studies, Cornell University. Translated by Laura Summers from the French original.

[31] Becker, E. 1986. *When the War was Over. The Voices of Cambodia's Revolution and its People.* New York: Simon and Schuster.

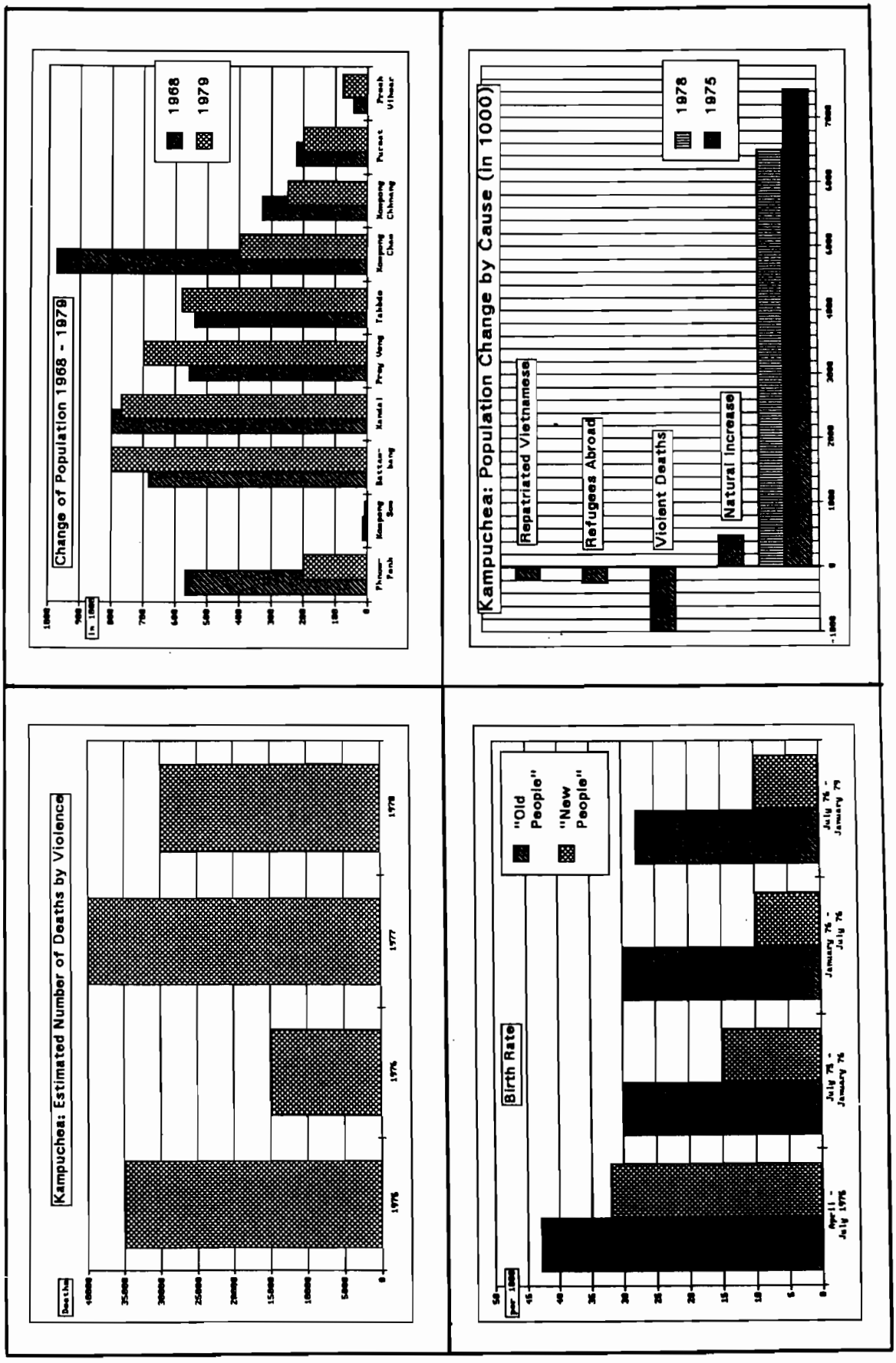

Figure 4. Demographic consequences of the Pol Pot regime. Source: Méng-Try (1981).

Today we know that this revolutionary group only meant the extermination of what they called "bourgeois elements" and "agents of imperialism" - such as individuals who needed spectacles or could speak a foreign language.[32] When the "social experiment" of the Khmer Rouge was stopped by the Vietnamese invasion,[33] between 1 and 1.2 million Cambodians had been killed - not only in those "killing fields" and work camps that made us shiver from abhorrence, but mainly from starvation.[34] According to estimates by Méng-Try "only" some 100,000 to 120,000 Cambodians were victims of atrocities; the rest died in the famine. This food shortage was triggered by the intensive collectivization and evacuation of the urban population to the countryside without advanced planning. It was based on pseudo-scientific theories of society, economy, and human nature.[35]

5. SYSTEMATIC TERROR AND SUPPRESSION

There were not many rulers in history that put a people into deeper crises than Joseph Stalin. His Soviet regime executed all kinds of atrocities - most of them with massive demographic consequences. Through forced collectivization and deportation of peasants he triggered a large famine in 1930-1933, especially among the rural population in the Ukraine. Most estimates range from 3 to 5 million excess deaths due to starvation.[36] Taking into account abnormal death due to malnutrition in 1932 and 1943 Maksudov has estimated up to 6 million famine-related deaths.[37] Some authors, however, have substantially higher estimates that range between 9.0 and 12.3 million.[38]

The Kazakhs, a semi-nomadic people, especially suffered from Stalin's destruction of traditional agriculture. When their sheep population on which they depended was wiped out in 1931 to 1933, a large number fled to China and other republics. However, some 1.3 to 1.75 million died due to malnutrition. If the high estimate is correct, some 42% of the entire Kazakh population perished within only three years. For this people it was certainly a demographic disaster of the first magnitude.[39]

---

[32] See: Palmieri, V.H. 1982. Famine, media, and geopolitics: the Khmer relief effort of 1980. Pages 19-27 in K.M. Cahill, ed. *Famine.* Maryknoll, New York: Orbis Books.

[33] The invasion of Vietnamese troops, of course, was not due to altruistic motives of stopping the slaughter of a people, but a move in the fight for regional dominance.

[34] Ea Méng-Try. 1981. Kampuchea: a country adrift. *Population and Development Review* 7(2):209-228.

[35] Willmott, W.E. 1981. Analytical errors of the Kampuchean Communist Party. *Pacific Affairs* 54(2):209-227.

[36] Nove, A. 1990a. How many victims in the 1930s? *Soviet Studies* 42(2):369-373.

[37] Cited from: Nove, A. 1990b. How many victims in the 1930s? - II. *Soviet Studies* 42(4):811-814.

[38] Ellman, M. 1991. A note on the number of the 1933 famine victims. *Soviet Studies* 43(2):375-379.

[39] This estimates are all cited from: Nove, 1990b, *op.cit.*

Stalin's terror regime, however, had many faces. His repertoire included the deportation of large sections of the population (especially the so-called "kulaks"), mass shootings, and the systematic detention of millions. Among those deported were a wide range of victims. Not all lived on the brink of starvation and death. Alec Nove has estimated that probably " 'only' a million men, women and children died under the often terrible conditions of deportation" - which is less than other authors previously estimated. The total number of detainees, including those in the Gulag system, prison inmates, penal colonies and persons in "special settlements" was estimated by Alec Nove at 3.59 million. During the Stalin era there were at least 2000 prisons and concentration camps in the Soviet Union.[40] Nove has estimated the total number of non famine-related deaths - that is all those due to deportation, detention, and shooting - at 3 to 4 million.[41]

All estimates cited above are for the pre-1937 period. For those in custody the conditions became worse after 1937. Robert Conquest reports that no more than 10% of those in custody in 1937-1938 survived. This would add another 8 million casualties of Stalin's terror. The baseline of all these estimates and calculation is this: while all numbers are highly uncertain and further work is obviously needed to uncover the truth, it is not unlikely that Stalin's terror caused the death of some 20 million people (including some 7 million victims of the 1933 famine, but not including war-related excess mortality).[42]

It is, of course, difficult to distinguish Stalin's terror from other types of population-related crises, such as genocide, warfare, induced famine, or mass deportation. He used all kinds of coercive measures to stabilize his regime. He was a dictator whose power grew out of the barrel of guns; but he was also a master of propaganda and censorship. He collectivized agriculture with brutal force and deported the kulaks, ignoring the enormous loss of human life due to famine and hardship of circumstances. Among the Kazakhs his regime committed a (near) genocide. Millions vanished in the Gulag system. When the 1937 census of the USSR revealed an enormous population deficit, Stalin simply declared it invalid, stopped its publication and ordered the statisticians to be shot to eradicate any evidence.[43] The Stalin period in the Soviet Union was not characterized by a single crisis; it was a syndrome of multiple, interrelated crises that shaped the country (and its demography) for the next 60 years. Since systematic terror was a major driving force of the crisis syndrome, we have put it under this separate heading.

---

[40] Shifrin, A. 1980. *The First Guidebook to Prisons and Concentration Camps of the Soviet Union.* Stephanus Edition Weewis.

[41] Nove, 1990b, *op. cit.,* p. 813.

[42] These are most recent estimates from: Conquest, R. 1991. Excess deaths and camp numbers: some comments. *Soviet Studies* 43(5):949-952.

[43] The 1937 census of the Soviet Union showed a population deficit of between 17 and 18 million. The critical question is how much of this deficit was due to excess mortality and which proportion was a decline of births.

6. MASSIVE DISPLACEMENT AND FORCED MIGRATION OF PEOPLES

Since the "rape of the Sabine women" (and most likely even before) the mighty frequently claimed for themselves the right to abduct people. Hitler and Stalin executed this practice to its extreme. However, the full magnitude of systematic abduction of whole people in the Hitler/Stalin era will probably never be known; it certainly was in the order of many tens of millions.

Systematic displacement of people as a means of politics was not a sole privilege of these monstrous despots. Since World War II we have had numerous cases of forced migration. The "Red Guards" in Mao's China virtually kidnapped hundreds of thousands of urban intellectuals (or whom they considered Westerners) and carried them away to the countryside. Pol Pot's Khmer Rouge explicitly declared the de-urbanization of Cambodia a central element of their shrewd political ideology. When they ordered the evacuation of Phnom-Penh the population had to leave their town within a few days and walk to far-away rural districts - men, women and children. Between 1968 and 1979 Phnom-Penh's population declined from some 580,000 to 200,000 inhabitants.

The world of today is full of refugees, displaced persons, labor migrants and people living under resettlement schemes. The UN Population Division estimated that the world's refugee population stood at approximately 17 million persons in late 1989 (including some 2.3 million Palestinian refugees).[44] The crude numbers do not reveal the full scope of these tragedies. A few weeks ago a most dreadful case of forced migration was in the media: in Myanmar, as the ruling State Law and Order Restoration Council calls Burma, between 150,000 and 170,000 members of ethnic minorities were forced to leave the country; they fled to the poor Bangladesh.[45] The tide of refugees is still rising all over the world. These days again hundreds of thousands are forced to leave their homeland in former Yugoslavia.

7. ECOLOGICAL CATASTROPHES

Earthquakes, floods, volcanic eruptions, thunderstorms and other natural catastrophes have certainly affected populations to a certain extent. In 1883 the Krakatao eruption and its 20 m high tidal wave caused the death of some 36,000 people living at the coasts of West Java and Southeast Sumatra.[46] In 1906 the "Great Earthquake" in San Francisco triggered a fire-storm which burned down most of the old city. The destruction of some 28,000 buildings left more than 250,000 people homeless and caused losses of about 350

---

[44] United Nations. 1991. World Population Monitoring, 1991. Draft. ESA/P/WP.114. New York: Population Division of the Department of International Economic and Social Affairs.

[45] See: Wachsende ASEAN-Kritik an Burmas Herrschern. Katastrophale Lage der Flüchtlinge (Increasing ASEAN criticism towards Burma's rulers. Catastrophic situation of refugees). *Neue Züricher Zeitung*, 14/15 March 1992, p. 5; Myanmar's Monsters. *The Economist*, 29 February 1992, p. 17.

[46] Symons, G.J. 1888. *The Eruption of the Krakatao.* London.

billion dollars. However, only 667 (!) people were killed in the incident. In recent history the largest number of casualties in earthquakes were between 200,000 and 830,000 (see Table 3). While natural catastrophes in the past have caused severe human suffering, their demographic consequences have been relatively small, as compared to losses of war, political terror and deportation.

Table 3. Estimated number of casualties in the eight largest earthquakes, 526-1991.

Date	Location	Estimated Number of Dead
May 29, 526	Antioch, Turkey	250,000
January 24, 1556	Shangxi, China	830,000
December 16, 1920	Kansu, China	180,000
May 22, 1927	Nan-Shan, China	200,000
October 11, 1937	Calcutta, India	300,000
July 10, 1949	Tadzhikistan, USSR	120,000
July 28, 1976	Tangshan, China	750,000
March 31, 1983	Popayán, Colombia	200,000

Source: Wright, J.W., Ed. 1992. *The Universal Almanac.* Kansas City, New York: Andrews and McMeel.

Is this also true for man-made environmental crises? Could global warming, for instance, trigger worldwide agricultural stagnation or even an outbreak of famines? Some scientists are expecting long-term changes in agricultural potentials, especially due to shifts in growing zones. They have estimated that "in the mid- to high-latitude cereal growing zones, shifts of several hundred kilometers per °C change are possible".[47] In semi-arid regions they anticipate an increase in short-term climatic variability which could trigger abnormal droughts and extensive floods.[48] Other scientists vigorously oppose these projections. Vaclav Smil, an eminent expert in agriculture and environment, warns of "false perceptions, misplaced worries, panicky reactions and dubious commitments...".[49] He is convinced "that some of the world's major food producing areas would abundantly benefit from the combination of higher CO_2 levels, higher temperatures, and more

[47] Parry, M.L. and T.R. Carter. 1988. The assessment of effects of climatic variation on agriculture: aims, methods and summary of results. Page 11 in M.L. Parry, T.R. Carter, and N.T. Konijn, eds. *The Impact of Climatic Variations on Agriculture. Vol. 1: Assessment in Cool Temperate and Cold Regions.* Dordrecht: Kluwer Academic Publishers.

[48] Parry, M.L., T.R. Carter, and N.T. Konijn, Eds. 1988. *The Impact of Climatic Variations on Agriculture. Vol. 2: Assessment in Semi-Arid Regions.* Dordrecht: Kluwer Academic Publishers.

[49] Smil, V. 1987. *Energy, Food, Environment. Realities, Myths, Opinions.* Oxford: Clarendon Press, p. 339.

precipitation."[50] In other areas, where the new environmental conditions would tend to decline harvests, new crop varieties and agricultural techniques could easily level out the effects of gradual climatic change. Contrary to conventional wisdom demographic impacts of anthropogenic environmental change are far from certain. We not only lack essential data, but there is also a broad controversy on how to interpret available information.

Radioactive pollution is certainly one of the most serious environmental threats. Depending on its level it can have both short- and long-term demographic consequences. Until today, the Chernobyl accident probably had the most serious environmental impact. According to recent estimates by the Yavorivskiy Commission of the Ukrainian Supreme Soviet the immediate casualties of the accident, however, were relatively few: "120 residents of Ukraine were ill with radiation sickness; 3,000 were suffering from occupational disease, 1,500 were invalids; and 4,500 cleanup workers were suffering from various diseases".[51] Altogether some 500,000 to 600,000 persons had been involved in the clean-up effort after the accident; 5000 to 7000 of these might have died from radiation-related diseases.[52]

While the immediate consequences of the Chernobyl accident are minor from a demographic perspective, its long-term impact might be not. If we include all those that have been affected by radioactive fallout we end up with a much higher number: one-third of the Byelorussian republic with a population of some 2.2 million (including 800,000 children) has been contaminated by radioactive fallout. In addition some 60,000 children were radiated in the first days after the accident in the Ukrainian republic and some 380,000 children were affected by radioactive fallout. Some 135,000 persons had to be evacuated[53] from the contaminated zones.[54] There is no doubt, that the medical effects of the disaster have been (and will be) considerable. According to reports, cases of anemia already increased by 700-800% during the past five years in the fallout zones of Byelorussia; the increase of leukemia and other cancers was not quantified but is reported to be substantial. Gale and Hauser have estimated that some 50,000 people worldwide may die of cancer as a result of the Chernobyl accident.[55] Soviet organizations have admitted that the accident may yet cause up to 300,000 deaths.[56]

---

[50] *Ibid.*, p. 278.

[51] Cited from: Marples, D.R. 1991. Chernobyl: five years later. *Soviet Geography* 32(5):300.

[52] Marples, D.R. and Y. Risovanny. 1990. Revelations of a Chernobyl insider. *The Bulletin of the Atomic Energy Scientists* 46(10):16-21.

[53] Recent data suggest that the evacuation that was planned for 50 years, will have to be very much extended.

[54] Gale, R.P. 1990. Long-term impacts from Chernobyl in the USSR. *Forum for Applied Research and Public Policy,* Fall, pp. 93-94.

[55] Gale, R.P. and Th. Hauser. 1988. *Final Warning: The Legacy of Chernobyl.* New York: Warner Books, pp. 175-176.

[56] What Chernobyl did. Not just a nuclear explosion. *The Economist,* 27 April, pp. 21-23.

However, the demographic effects of this tragedy might be difficult to detect. Since most diseases triggered by low to medium levels of radiation are chronic and need considerable time to develop (such as cancer), the accident-related mortality will be distributed over many years. It is also possible that changes in other cancer-related risk factors, such as smoking or unhealthy diets, will obscure the effect of the nuclear accident.

8. EPOCHAL CHANGE THROUGH MULTIPLE CRISES

There are population-related crises that do not fit into our definition given above: they are not a single episode that evolve rapidly within a few months or years, such as a war, a famine, an epidemic or a natural catastrophe. This special kind of fundamental change is made up of many interrelated crises and can span over decades and centuries; sometimes the people are not even aware that they are in the middle of a fundamental (demographic) revolution. There are (at least) two examples of this type of crisis: (a) the epochal struggle for dominance over the American continent, that led to the near extinction of the native Indian population, and (b) the population explosion in the Third World during the past four decades.

(a) Epochal Struggle for Dominance in the Americas. When Columbus made his landing in the New World, which he considered to be India, some 15 to 20 million indigenous people (whom he called Indians) inhabited both parts of the continent.[57] They were very unevenly distributed: a relatively small number lived in what is now the United States (perhaps 850,000 to 1.1 million), even fewer settled in Canada (some 200,000). Many more native Americans lived in Mexico, Central America and the Caribbean (some 5-7 million). The great majority of Indians, however, settled in South America (more than 10 million), mainly in the Andes.[58]

Four centuries later, the native peoples of the Americas had experienced a demographic collapse of epochal dimension. In 1890/1900 the Indian population of the United States had declined to some 220,000. In Mexico, only about 2 million Indians remained after one hundred years of Spanish rule. For the region south of Mexico it is difficult, if not impossible, to quantify the decline of Indians due to colonization, but there can be no doubt that it was substantial.[59]

There is, of course, much disagreement on the numbers. According to more recent estimates published by Thornton the pre-Columbian population of the Western Hemisphere was more than 72 million (2 million in what is today Canada and 5 million

---

[57] Pre-Columbian population statistics for the American continent are highly uncertain. Estimates range from 8 to 75 million indigenous inhabitants. Most authorities, however, accept figures somewhere between 15 and 25 million.

[58] Mooney, J. 1928. The Aboriginal population of America north of Mexico. *Smithsonian Miscellaneous Collection* 80(7).

[59] Depending on the definition of "Indian", estimates range from 7 to 30 million as the total Latin American Indian population.

in the conterminous United States). He also calculated that in 1890/1900 the native American people (including South America) had declined to about 4 to 4.5 million.[60] If these number are correct, the native American population declined to about 6 percent of its former size.

While decreases in birth rates contributed to the decline, it is clear that an increase in mortality was of primary importance. Detailed studies have shown that multiple causes, all stemming from European contact and colonization, contributed to this unprecedented demographic collapse. The single most important factor was introduced disease, such as smallpox, typhus, and measles. Dobyns calculated that as many as 93 serious epidemics of Old World pathogens affected the native Americans from the early sixteenth to the beginning of the twentieth century.[61]

American Indians also suffered substantial population loss due to wars after the European arrival. Not all of these occurred between Indians and Europeans; many Indians were killed in intertribal conflicts, triggered by European interference with tribal relations. No data are available to precisely quantify war-related deaths among Indians, but according to various estimates they might be in the range of 150,000 to 500,000. Some of these wars were not fought between armed men. At Wounded Knee Creek in South Dakota several hundred Indians - old men, women, and children - were massacred by white soldiers. These were not isolated atrocities. In California the depopulation of the native Indians was mainly due to cruelties and massacres committed by early settlers; in its effect it was genocide. Entire tribes were wiped from the face of the earth.

Forced relocation of Indian tribes from one area to another was yet another cause of population decline. Most North American Indians had to leave their homeland for resettlement in small geographical areas (reservations). The harsh conditions during the move and the living conditions in the new areas increased mortality rates. Thornton estimated that the Cherokee removal of the late 1830s killed half of the population of this tribe.[62] The forced migration contributed to a destruction of the Indian way of life, but the key factor was the destruction of the economic base of Indians. The (deliberate) mass-shooting of wild animals, such as the near extinction of the buffalo, undermined the Indian's food supply. The buffalo population declined from some 60 million in pre-colonial times to less than 1000 in 1895.[63]

The demographic collapse of the American Indians was a crisis triggered by multiple economic, political, and cultural factors. It was a fight for racial dominance. As millions migrated from Europe to the New World (joint by forced migration of slaves from Africa) great nations began to develop in the Americas. This remarkable increase of

---

[60] Thornton, R. 1987. *American Indian Holocaust and Survival. A Population History since 1492.* University of Oklahoma Press.

[61] *Ibid.*, p. 45.

[62] *Ibid.*, p. 50.

[63] *Ibid.*, p. 52.

Euro- and Afro-American populations in the Western Hemisphere, however, was based on the near extinction of ancient people.

(b) Third World Population Explosion. There are crises that unfold silently before they hit. The steep population growth in the Third World since the 1950s was considered a minor problem or even a positive trend by many governments. Brazilian leaders dreamed of populating the vast empty interior of the country and the post-colonial African states (and tribes) thought the number of people a matter of strength. Only when poverty, chronic malnutrition, poor health, and a low level of education prevailed in many parts of the Third World despite significant economic growth, the power elites began to realize that the pace of population growth and a high level of population density could be a cause of stagnation. At that time the demographic momentum (in the form of extremely young populations) was already built up that will fuel rapid population growth for many decades in the future. Countries, such as Egypt, Kenya, Nigeria or Bangladesh, fell prey to a "wolf in a sheep's clothing": before they realized the implications of their unprecedented population growth, a demographic crisis was well under way.

I am well aware that some demographers would vigorously object to my argument that the present population trends in developing countries are a form of crisis. While there is quite a number of (Asian and Latin American) nations that have managed to change their population explosion into a more or less gradual (demographic) transition, we can also find many Third World countries that are obviously overwhelmed by a demographic crisis. Countries such as Bangladesh, Egypt or Kenya have (nearly) lost the capacity for economic development, peaceful social change, or rational planning and administration. Their educational system is blown up by the ever-rising tide of children and young adults; their labor market is put under unbearable pressure; their cities explode due to the migration of landless rural excess population; and during the first half of the next century their baby-boom generations will be of pension age with few resources available for their pension and health care.

This is not the place to examine in detail whether Third World population growth is in fact a demographic crisis or not. I think it is in some countries, but detailed studies would be necessary to prove the argument. My only intention was to characterize the unprecedented population growth in the Third World as a potential candidate for an epochal crisis.

THE STRUCTURE OF CRISES

As we have seen above there is a broad range of events that can cause massive loss of human life. Of course, we have to be aware that these crises are extremely different. There is enormous heterogeneity of victims, as well as among those that trigger the crisis.

- Some crises, such as epidemics or natural catastrophes are completely (or mostly) beyond human influence. The "Black Death" in 14th century Europe or the Great San Francisco earthquake are examples. They hit unexpectedly. The only thing we can do in this type of crisis is to implement early warning systems and to minimize demographic consequences by preventive measures.

- Other crises are unintentionally triggered by human behavior. Many famines are of this type, but also ecological catastrophes. Sometimes these crises hit those who trigger them; sometimes they affect other people. The famine during the "Great Leap Forward" was induced by a small group of leaders who wanted to industrialize China within a few years; only when millions of their countrymen had starved to death did they realize their "error". The building of nuclear power plants is certainly led by good intentions; since Chernobyl we know that it could end in disaster.

- Some of the most terrible events that killed millions were not accidents or unintended side effects of certain political measures, but brutally planned and executed by powerful regimes. The holocaust of the European Jews, Stalin's Terror Regime, or Cambodia's "Killing Fields" have caused enormous loss of human life among innocent people who had little or no chance to defend themselves.

- Wars are yet another category of crises: sometimes they are planned and started with the full intention to gain dominance, sometimes the participants somehow drift into military conflict. While the death toll of wars was enormous in human history, at least some of the victims (on both sides) were not innocent or defenseless. Violent aggression seems to be an anthropological constant of the human race; and armed combat is the most extreme expression of this heritage. However, millions of innocent civilians (and ordinary soldiers) were also killed in wars.

- And finally, crises can be a mixture of events - some of these might be planned, others unintended. These crises typically incorporate many divergent phases and several groups of victims. The world refugee problem could be seen as an example.

DISCUSSION

The demographic dimension of war. War is often considered the ultimate crisis. While a worldwide nuclear clash might in fact cause the eradication of the human race, historical evidence shows that the demographic impact of war was relatively minor. Current trends also suggest that its impact might be minimized in the future. This argument is certainly in contrast to conventional wisdom. Many Europeans have opposed modern weaponry by arguing that it is intended to maximize destruction of human life while saving physical infrastructure. The neutron-bomb, and chemical and biological weapons are good examples of this cynical capacity. However, there are also converse tendencies: during the occupation of Kuwait the allied forces, led by the USA, fought Iraq with high-tech weapons (including "intelligent" bombs and rockets) that could be precisely targeted to destroy physical infrastructure, such as streets, power plants, communication installations and factories. Contrary to arguments of West European intellectuals during the conflict, the war was not a mass massacre among Iraqi soldiers and civilians. Given the scope of military actions it was probably the war with the smallest number of casualties on both sides. Modern strategies of war (and even more important, modern strategies of terrorism and guerilla combat) are targeted to destroy the enemy's lines of command, increase his costs, wreck his economy, demolish his morale and destabilize his political structures. It could well be that the times of (mutual threat of) mass destruction are gone. Intelligent weapons and strategies might be able to

pick out and destroy only individuals and infrastructures that are essential for the functioning of the enemy's society. This would further reduce the demographic consequences of war.

Perception of crises. We all tend to dramatize the consequences of crises and ignore the effects of chronic conditions. AIDS is a good example. When physicians diagnosed the first HIV infections among women, not only news magazines projected a worldwide epidemic among the general, heterosexual population. And when surveys uncovered the spread of HIV among some urban populations in Africa, even hard-core virologists predicted the eradication of some 50 percent of the African population.[64] Amateur demographers tend to dramatize the effects of crises, while ignoring the malignant nature of many other chronic conditions. A case in point is the demographic effect of tobacco use. It is well documented that tobacco use (smoking, sniffing, chewing) causes some 500,000 (!) premature deaths *per year* in the USA alone - far greater than the mortality from any other preventable cause of death in our time.[65] "If present trends continue, by the year 2000 the world tobaccosis death toll for this century will mount close to 100 million - a number roughly equal to the global death toll from all international warfare this century."[66] According to the most pessimistic projections the cumulative number of AIDS deaths till the end of the century will not exceed 30-40 million.

Bad news obviously triggers an early warning system which seems to be a bio-cultural heritage of man. At the first signs of a looming crisis, some of us (journalists, scientists, and interested layman) cry out loud to warn the others. This happened in recent history in the cases of AIDS, tropical deforestation, climate change, depletion of the ozone layer, or mass migration from the former Soviet Union. Usually a closer look reveals that the further trends of the phenomenon are highly uncertain and its demographic consequences nearly impossible to predict. On the other hand, our intense interest in crises often leads to ignorance of chronic conditions. Persistent malnutrition, poor sanitation, deficient fresh water supply, and spread of "classical" infectious diseases in large parts of the Third World almost certainly cause a much higher number of unnecessary deaths than any other of the currently discussed world crises (see Table 4).

---

[64] Dr. Gerd Frösner is Professor of Virology at the Max-von-Pettenkofer-Institute, University of Munich. He compares the AIDS epidemic with a global nuclear catastrophe and considers it possible that AIDS will have killed half of the African population by the end of the century. See: Frösner, G. 1987. Das AIDS-Virus nimmt keine Rücksicht auf gesellschaftliche Vorstellungen (The AIDS virus does not consider social values. Letter to the Editor). Leserbrief in der *Süddeutschen Zeitung* 58:38.

[65] Ravenholt, R.T. 1990. Tobacco's global death march. *Population and Development Review* 16(2):213-240.

[66] *Ibid.*, p. 238.

Table 4. Demographic consequences of selected events.

Event	Estimates based on analyses of demographic statistics and other quantitative sources/3	Estimates based on model calculation, educated guessing or pure speculation/4
(1) World War I	6.3 million soldiers	
(2) World War II	40 million soldiers 15 million civilians	
(3) Stalin's Terror Regime	20 million, including 7 million famine victims	
(4) Holocaust of the Jews	5.7 million	
(5) Conventional Wars Since 1945	50 million casualties	
(6) Demographic Collapse of the Indigenous American People	a decline of between 75% to 96% for the North American Indians	
(7) Cambodia's Pol Pot Regime	1-1.2 million	
(8) AIDS Epidemic	340,000 reported AIDS cases (April 1991); estimates: 1 million AIDS cases worldwide	currently 10 million HIV infected worldwide; total casualties of epidemic unknown, estimates range from some hundred thousands to many hundred millions
(9) 14th Century "Great Plague"		ca. one-third of European population mainly due to subsequent famines
(10) China's "Great Leap Forward"	23 million victims due to starvation	in addition: 20-30 million physically harmed
(11) Worldwide Nuclear War		2.2 billion casualties, including 1.1 billion killed immediately and 1.1 billion severely injured
(12) Chernobyl Disaster	up to 5000 clean-up workers have already died	up to 300,000 deaths; 2.2 million were seriously affected by radioactive fallout
(13) Current Number of Refugees	17 million, including 2.3 million Palestinians	
For comparison: death toll a chronic condition		
(14) Tobacco Use	100 million excess deaths from the beginning of tobacco use until the year 2000	

Sources:
(1) *Der Grosse Plötz* (1986), p. 848; (2) *Ibid.*, p. 916; (3) Conquest (1991), p. 951; Nove (1990a), pp. 811-814; Nove (1990b), pp. 369-373; (4) *Der Grosse Plötz, op.cit.*, pp. 890-891, 945-946; (5) *Ibid.;* (6) Mooney (1928); Thornton (1987), p. 42; (7) Méng-Try (1981); (8) Placa (1991), p. 372; (9) *Der Grosse Plötz, op.cit.*, pp. 495, 514; (10) Ashton et al. (1984), pp. 613-645; Banister and Preston (1981); (11) *Population and Development Review* 9(3):562-568; (12) Marples (1991), pp. 300-302; (13) United Nations (1991), p. 400; (14) Ravenholt (1990), p. 238.

How can we identify demographic causes and consequences of crises? It is not possible to answer this question in our short overview. However, we can specify some aspects that seem to be essential to the problem:

- First, demographic consequences of crises should not be analyzed exclusively on the level of aggregate statistics, such as total population figures. There were many serious crises in history (from epidemics and famines to wars) that are hardly discernable on a graph of national population trends. Other demographic measures, such as the age and sex composition of a population or its distribution between regions and ethnic groups, are more indicative of crises-related demographic change.

- Second, it is essential to distinguish between excess mortality (or crises-related deaths) and the birth deficits that might (or might not) be associated with the crisis. Some Soviet and East European demographers have estimated the losses of World War II by including natural population increase which would have occurred had there been no war. Of course they reached rather high figures. While there is a clear link between mortality and certain crises, the association with fertility is rather weak. In times of crises births are usually only postponed to better times. A certain proportion of these births might be permanently lost due to higher age of the women after the crisis; but this proportion is very difficult to quantify. It is also hard to determine the *normal* level of fertility. During the crisis this level might have changed due to factors not related to the crisis. In other words: in the case of mortality we talk about real persons, in the case of fertility we deal with "purely hypothetical unborn souls".[67]

- And third, it is hard to find social, economic or environmental crises that were undoubtedly *caused* by demographic factors. The history of mankind is a succession of wars, epidemics, famines, and natural disasters that caused the death of millions - but only few of these crises were the obvious consequence of a demographic phenomenon. The population explosion in Third World countries since the 1950s might be the only exception: according to many development experts, unprecedented population growth is a key factor in most of their social, economic, and environmental difficulties. However, according to other experts, even this demographic phenomenon is rather a consequence of (previous) crises than a cause of present problems.

[67] Nove, 1990b, *op. cit.*, pp. 811-814.