Health in Nicaragua

Epidemiology of Aggression

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Though the Nicaraguan revolution is still fighting for survival against escalating US aggression, it has ushered in far-reaching changes in the field of health and health care. These changes are examined in this paper. The author refers to the role health workers played in the Nicaraguan revolution and discusses the post-revolutionary reforms introduced in the health care system and the consequences of US imperialism's continuing war against Nicaragua for the people's health. Health professionals, the author argues, will have to understand the epidemiology of war better since the world is likely to witness more revolutionary upheavals and crises as well as imperialist aggressions.

A QUARTER of a century ago, the victory of the socialist revolution in Cuba, till then the so-called backyard of the US imperialism, generated a new wave of revolutionary movements, not only in the Carribean basin, Central America and Latin America, but all over the world. The revolutions in Grenada (March 1979) and Nicaragua (July 1979) widened the breach opened in the imperialist empire by the Cuban and Indochinese revolutions. The revolution in Grenada was, however, crushed by US imperialism before the whole process could completely unfold and get fully consolidated. The revolution in Grenada nevertheless inaugurated changes in the health and health care system of that country, though it is beyond the scope of this article to deal with them. Also, the information available to us is very fragmentary to allow us to discuss the changes in detail. On the other hand, although the Nicaraguan revolution is still fighting for its survival against escalating US aggression, it has unleashed far more profound changes in all aspects of people's social life, including in the field of health and health care, enabling us to examine them in considerable detail

There are few regions which have been so much the object of the foreign policy of an imperialist power as Central America and the Carribean. It has been the theatre for permanent US intervention for 85 years. The US has always claimed the right to lay down the law there. It considers this whole region to be an integral part of its 'defence system' and has 40 to 50 military bases there and is building many new ones. In 1982-83, 20 per cent of entire US military budget was earmarked for this region. Behind this military involvement is the US economic interest in the area which is a major communications and trade route as well as a great raw material reserve and source of cheap labour power in the international division of labour (Fourth International, 1985, p 89). This is the reason why the countries in this region are kept strictly subordinated to imperialism to such an extent that the political regimes there are 'created' by the US.

The super-exploitation of people there by imperialism has led to deterioration of living standards to abysmal levels, extreme poverty, unemployment, and so on. The resistance to this exploitation has also grown so much so that people are in a state of permanent war with the military state machines. The health consequences of this continuous war are far-reaching; to the extent that the health professionals are suddenly required to scientifically understand the health consequences of war or the epidemiology of war and agression.

Nicaraguan Revolution: Historical Background

The Subjugation: Nicaragua, like other parts of Central America, was conquered in 1523 by the Spaniards and they subjugated the Chorotec Indians of the Aztec family. It become a centre for slave trade for more then three centuries under Spanish rule. It attained "independence" in 1821 and slavery was abolished in 1824 (Weber, 1981, pp 1-5). Ever since its "discovery" Nicaragua has always been of interest to the great powers. The US has militarily intervened in Nicaragua at least three times.

The first US armed intervention took place in the mid-nineteenth century at the time of California gold rush. This intervention, though short-lived, opened a way for US financial and political interests which, in the course of half a century, converted Nicragua into a coffee exporting country with a plantation economy. Coffee constituted 50 per cent of the value of Nicaraguan exports till the cotton boom of the 1950s. All exports were chiefly to the US. The second US intervention took place in 1909 and US forces continued to occupy the country from 1909 to 1925. When the US withdrew its forces in 1925 it thought that the regime backed by it would survive, but the rebellion against the puppet regime led to the third US intervention within months after the withdrawal. This time the US continued to occupy Nicaragua till 1933.

During this third intervention, the US helped create a military force, called the National Guard, in 1927. The National Guard was at the beginning commanded, equipped, trained and financed by the US. The chief of the National Guard, Anastaslo Somoza Gracia, seized power in 1936 and established a US backed family dictatorship lasting for almost fifty years (Weissberg, 1981). Under Somoza, Nicaragua acted like a true puppet of the US and, through the National Guard, provided counter-revolutionary military forces during the 1954 attack on the progressive Arbenz regime in Guatemala (which incidentally, profoundly politicised a doctor, Ernesto 'Che' Guevara, who subsequently led the Cuban revolution with Fidel Castro) and during the 1965 offensive in the Dominican Repubic. It was from Nicaragua, moreover, that the CIA mercenaries left for the 1961 Bay of Pigs landing in Cuba, the most concerted (albeit unsuccessful) US attempt to destory the Cuban revolution (Weber, 1981, p 30).

The Revolution: The third US intervention in 1925-26 inspired a nationalist uprising led by general Augusto Cesar Sandino. The war of resistance, fought on the lines of guerilla warfare, lasted till the murder of Sandino on 21st February, 1934. But it helped in radicalising many individuals who had been also influenced by the October Revolution. The 1959 Cuban revolution gave the struggle in Nicaragua further impetus and in 1962 the *Frente Sandinista de Liberacion Nacional* (Sandinista National Liberation Front, FSLN) was formed. The FSLN combined guerilla military warfare and rural and urban mass organisation and mobilisation for 18 years to lead the revolutionary insurrection on 19th July, 1979 that overthrew the Somoza regime, destroyed the erstwhile state power and created a completely new state apparatus under the leadership of the FSLN. It is under the leadership of the FSLN that the reconstruction of the Nicaraguan society is under way.

Before we take up discussion of the changes in the Nicaraguan health services after the revolution, it would be useful to know what role the health functionaries played in the revolution, although this aspect of the revolutionary movement is not very well documented. While the health care services have long been deficient in the Central American region, doctors, medical students and other health functionaries have participated in and even led struggles for social reform. Some examples can be given easily. Che Guevara in Guatemala, Calderon in Costa Rica, Romero and Castillo in El-Salvador, Bolanos and Rosales in Nicaragua and Morales and Alvarado in Honduras led political movements and governmental efforts toward the establishment of social security systems, workmen's compensation, the legalisation of unions, and agricultural reform (Garfield and Rodrigues, 1985). In Nicaragua, besides the above-mentioned doctors, reference can be made to a hunger strike by the health workers in the capital, Managua, in January 1979, in protest against the killing of dozens of people participating in a gigantic demonstration to mark the first anniversary of the assassination of Pedro Joaquin Chamarro, an anti-Somoza editor of the bourgeois paper *La Prensa* (Weber, 1981 p 4).

Post Revolutionary Health Services Reforms

Basic Principles

Nineteen days after the victory of the Nicaraguan revolution the new government issued a declaration outlining the basic principles of the new health care system. These principles are:

1 Health shall be a right of everyone;
2 Health services will be a responsibility of government;
3 The public will participate in health policy determination at all levels and
4 All health services will be planned on a regionalised, systematic basis, (Braveman and Roemer, 1985).

Special emphasis within the new system was put on maternal and child health, occupational health, and primary health care for everyone. To overcome the deficiency in the availability of health personnel, high priority was also given to producing them in much greater number and in a new mould.

Further, it should be kept in mind that these principles and new health care planning were inaugurated in the context of the thorough-going revolutionary reforms started in the entire social structure. The way the FSLN has introduced agrarian reforms, which undoubtedly have helped in improving the health status of the people will illustrate this point.

In July 1981, the first agrarian law was enacted which made it possible to confiscate land left lying fallow by owners holding 350 hectares or more of land on the Pacific Coast and 750 hectares or more on the Atlantic Coast. Another law enacted in early 1986 removed these limits of 350 and 750 hectares and has made it possible to confiscate land of all big landowners who do not plan for efficient production (Udry, 1986). The effects of these reforms can be seen in the fact that in 1978, 36.1 per cent of land was owned by those with more than 350 hectares, whereas they now (in 1984) own less than 11.3 per cent. The owners of more than 150 hectares of worked land, who possessed more than 50 per cent of the land in 1978, now have no more than 23.8 per cent. The land distribution has been carried through briskly. In the first fourteen months of the agrarian reform, the average rate of granting property titles was 647 per month, and the area of land involved was on average 15 hectares per family. In addition to the distribution of land for private cultivation, 38 per cent of land is under state ownership (APP 19.3 per cent) and co-operatives (10 per cent in Service Co-operatives, CCS and 8.7 per cent in Sandinista Agricultural Co-operatives, CAS) (Devilliers, 1984).

The contribution of these reforms to the improvement of the health status of the people cannot be underestimated, especially in a country which has a predominantly agricultural economy. Otherwise mere changes and improvements in health care delivery cannot achieve in seven years only, the tremendous improvement in the health status of the people. In short, what we are arguing for is not only that a revolutionary regime should seriously undertake thorough-going redistribution of wealth, but also that in order to make health a fundamental right of the people, people must be given the basic right over the means of production and the result of their productive labor power.

People's Participation

Another basic principle of the health services in Nicaragua is people's participation "in health policy determination at all levels". This term, 'Peoples Participation' is so much abused, particularly in the field of community health, that it must be put in a proper perspective in the context of Nicaragua. Fundamental to our understanding of people's participation is people's power—political and economic power in the hands of the working people, mediated through their own mass organisation and having decisive say in decision-making. Only if such people's power is existing can it get permeated in genuine participation of people in health care. Therefore, we must examine in brief whether these necessary pre-conditions for the genuine participation of the people, as envisaged in the basic principles, exist in Nicaragua.

The revolution in one stroke destroyed the essential part of the bourgeois state apparatus—its repressive forces—and created a new revolutionary army, called the Sandinista

People's Army (EPS), whose origin, composition, leadership structure and training was a *direct result* of the revolutionary struggle. The original police force was smashed and the Sandinista police was set up from working class fighters, thrown into unemployment because of war damage to the economy. In February 1980, the Sandinista People's Militia (MPS) was formed by arming tens of thousands of workers and poor peasants. The Sandinista Defence Committees (CDS) are another organised structure of the armed working people for their self-defence. While the EPS and the Sandinista police are part of the organised state structure, the MPS and the CDS are made of working people. The point to be noted is that the defence of the nation and exercise of power are not the functions of the state apparatus alone, but also of the armed volunteers from the urban and rural proletariat and the peasants. While discharging their duty as workers and peasants, the working people wield arms to fight against any attempt to take back the gains of the revolution. Therefore, even though the ruling classes are not completely expropriated—they continue to hold substantial economic power under the mixed economy—their *political* power is completely expropriated and any refusal by them to go along with the decisions taken by the revolutionary government is met with further expropriation, thereby deepening the revolution and consolidating the dictatorship of the proletariat.

Now let us see how these armed workers and peasants and even those who are not armed but come from the same classes have set up their mass and class organisations. We will mention five of them here: (1) the Sandinista Workers. Confederation (CST) and (2) the Associaton of Rural Workers (ATC). The CST and the ATC are trade union organisations representing about 75 per cent of urban and rural wage workers. They provide an organic link by their constant cooperation and thus materialising the workers and peasants alliance. (3) The National Union of Farmers and Ranchers/Stock Rearers (UNAG) (4) The Luisa Amanda Espinoza Associationof Nicaraguan Women (AMLAE) (5) The 19th July Sandinista Youth (JS 19) (Udry, 1985).

The Sandinista democracy rests in the first instance on these mass organisations. Their power is not subordinated to any other abstract concepts. Further, although the FSLN commands political hegemony on the working people, it has not brought the Nicaraguan society under one party straitjacket. Instead, at the larger level it has opted for political pluralism and has legally allowed all political parties, both bourgeois and working class to operate, however, within the framework of new realities. In November 1984 elections, the opposition got 30 per cent of votes. This shows that Nicaragua has opted for a different type of political structure by allowing all political ideas to contend for hegemony within the dictatorship of proletariat and has thus chosen to face up to a series of problem that are relatively new in the history of the transition to socialism.

This is why a worker and a farmer in Nicaragua is not only a worker or a farmer, but also an armed defender of revolution, a soldier, and some of them even health workers and/or leaders of their mass and class organisations. Thus, the people's participation in health care is *an integral part* of people's participation and control over all the socio-economic processes in the Nicaraguan society.

Health Care under Somoza

Nicaragua is one of the poorest countries in the region with a population of thirty lakhs. In addition to poverty, illiteracy and ill-health, it faces a severe problem of structural unemployment. This is illustrated by the fact that the entire work force in Nicaragua grew only 6 per cent from 1961 to 1971. While the population aged 15 to 64 years grew by 40 per cent in the same period. This led to massive urbanisation with a large proportion of the population living in shantytowns (slums) on the edge of major cities. Roughly, one-third (ten lakhs) of the country's total population is concentrated in its capital, Managua. This is one of the reasons why Nicaragua has 55 per cent of urban population despite the central role played by agriculture in its economy (Garfield and Rodriguez, 1985); 35 per cent of urban and 95 per cent of rural population lacked access to potable water (Halperin and Garfield, 1982).

As in any underdeveloped capitalist country, the official health statistics of pre-1979 Nicaragua are highly unreliable. Halperin and Garfield (1982) point out that "the Somoza regime paid so little attention to health matters that even such basic data as birth and death certificates were collected for only about 25 per cent of the population". The official estimate of the Infant Mortality Rate (IMR) was given as 35 per 1000 live births and was reported so in one of the WHO documents of 1980. A survey conducted in a part of rural Nicaragua in 1977, however, showed that the IMR in the sample population corresponded to an IMR of the order of 150 per 1000 live births (Heiby, 1981). Life expectancy at brith was 52.9 years. Indeed, Nicaragua had the lowest life expectancy at birth and one of the highest levels of the IMR in the region.

Malaria was a major public health hazard. Upto 60 per cent of the Nicaragua population had malaria during the 1930s. From 1934 to 1948, 22.4 per cent of all registered deaths were due to malaria. Upto 70 per cent of hospital beds were occupied by malaria patients during epidemics (Garfield and Vermund, 1983). The national malaria control programme was started in 1947 and was converted into an eradication programme, keeping with the change effected internationally at the behest of international agencies. According to Halperin and Garfield (1982), one-third of the people contracted malaria at least once in their lives. One of the important reasons for this high incidence of malaria was the indiscriminate use of insecticides in cotton and rice farming, leading to the Anopheles mosquito vector exhibiting resistance to all insecticides in common use, including DDT (dicophane), diedrin, malathion, propoxur and chlorofoxin. As a result in 1978 approximately 4.4 persons per 1,000 contracted this disease. The revolutionary civil war paralysed the health services and the incidence of malaria rose to 7.3 per 1,000 in 1979 and 9.4 per 1,000 in 1980 (Halperin and Garfield, 1982). This forced the Nicaraguan government to opt for, as an emergency measure, mass anti-malarial drug administration in 1981.

Besides malaria, tuberculosis and parasitism were endemic. Among the top ten killers of children were diarrhoea, tetanus, measles, whooping cough and malaria. Some of the major causes of death in 1973 are shown in Table 1:

TABLE 1

Causes of Death.	Death Rate per 100,000 population (1973)
1. Infectious and parasitic diseases	141.8
2. Diarrhoeal diseases	97.0
3. Pneumonia and influenza	190.5
4. Avitaminosis and other nutritional diseases	2.1
5. Homicide and war	24.0
6. Poorly defined causes	151.8

Source: Garfield and Rodriguez, 1985.)

Some studies in malnutrition have estimated that between 46 and 83 per cent of Nicaraguan children were malnourished. The same studies have indicated that a high proportion of these children (25 to 45 per cent) had the more severe secondary and tertiary types of malnutrition (Halperin and Garfield, 1982).

Health Services: A decade before the revolution four separate agencies and independent health ministry offices in each province ran in Nicaraguan health system. All four agencies and provincial officies of the health ministry functioned independently without any coordination. The ministry of health had the main responsibility for rural health care.

For the salaried population, the Nicaraguan Social Security Institute (INSS) was established in 1957. Twenty years later it served only 16 per cent of the economically active population and only 8.4 per cent of the country's total population. (Garfield and Taboada, 1984). Several churches ran highly respected hospitals, but for the most part they treated only those who could pay cash. The National Guard had relatively good medical services, including most specialities, through a system of hospitals and clinics of its own.

Health Expenditure: Of all the expenditure in the health sector, the INSS commanded 50 per cent, the ministry of health only 16 per cent and other local agencies, charitable and private insurance groups the remaining 34 per cent. (Garfield and Taboda, 1984). This way, a great divide was created between a tiny minority of insured salaried workers (mainly white collar government employees) and the overwhelming majority of non-insured. Preventive care was neglected, save for some disorganised attempts in respect of malaria. All of the INSS and much of the ministry's budget was devoted to curative care. Of the approximately 13 dollars per capita spent in Nicaragua in 1972 by the health sector, only about 3.15 dollars went for preventive care (Garfield and Taboada, 1984).

Health Personnel: The Somoza dictatorship considered students, especially in the health professions, a potentially subversive group and tried to limit their number. Thus, Nicaragua had only one medical school with 73 students in a class. The total number of doctors was 1,300 and there were only 43 professional nurses per 100 doctors. Not surprisingly, 80 per cent of rural health manpower consisted of folk-healers. We do not have any information about their indigenous medical practices and what the revolutionary government is doing about it.

An official community health experiment was carried out in Nicaragua from 1976 to 1978. In this programme, 768 *parteras* (traditional birth attendants) were trained in six-day courses, to carry out in their community improved obstetrical care, treatment of diarrhoea in children using packets of oral rehydration salts, provision of contraceptives, provision of aspirin for fever and pain and so on. A trained *partera* was given a free health kit [illegible] was required threafter to purchase supplies through the local government clinics. At the end of the experiment in 1978, about 40 per cent of the *Parteras* had already dropped out (Heiby, 1981). The government was so disinterested in the programme that it did not make any serious effort to keep it going nor did it carry out any follow-up work.

Thus, what the revolution inherited was poverty ill-health, unemployment and rickety health services. In addition, it also had to (1) care for the families of the 50,000 dead in the civil war and the 100,000 wounded people and their families, and cope with (2) considerable destruction of industry. (Somoza bombed his own industries to thwart revolution); disorganisation of two agricultural cycles with repercussions on food supplies and exports (GDP per capita had declined to levels of 17 years before), a massive foreign debt, a near-total lack of foreign currencies and high inflation, (3) a poorly developed economy (much less developed than Cuba in 1959), (4) dependence on agro-exports for earning foreign exchange, and (5) the ever-present threat of economic sanctions and even of a blockade (Fourth International, 1985).

Post-revolutionary Reforms

Many persons mistakenly think that immediately after the proletarian revolution, the revolutionary regime brings under state ownership *all* the means of production and services. Actually, while the state takes upon itself the responsibility of providing adequate health care, it does not do so by any such overnight take-over of the services. The seizure of state power and the nationalisation of the core of the economy can be timed by the day of the insurrection, but the actual consolidation of the revolution takes place in course of time, by a process in which the continuing class struggle within the country and internationally plays a prominent role. Even decades after the revolution in these countries, small-scale private producers (artisans, private medical practitioners, small capitalists, etc) are not completely expropriated. They survive as a marginalised sector and under restrictions. Therefore, an attempt to characterise a revolution in its initial years only on the basis of the proportion of the state-owned economy and services could lead to wrong conclusions. What is decisive is the ideology and class nature of the revolution's leading organisation, the actual role played by the new state in the ongoing class struggle—does the state side with workers and farmers? Does it expropriate those propertied classes who go against the people's interest?—and the development and extension of the workers' and farmers' power and control over all aspects of the new social structure.

The continuing presence of private sector in the economy thus does not disprove the proletarian character of the revolution, although such a sector does have subversive potential. This makes it more imperative for the revolutionary state to deepen the class struggle. The state of reform of the health care system in Nicaragua is also at this stage only. Although the state has undertaken full responsibility for providing health care (see basic principles cited above), and it has achieved astounding success in improving health care, this has not been done by sweeping abolition of the private sector and private practice. The trend, however, is clear. The state is for people's health care. Those health personnel who want to continue in the old way of looting people, will not be allowed to do so. First restriction and then, if necessary, expropriation.

Health Structure: Immediately after the revolution, the previously separate health agencies were integrated within the Ministry of Health (MINSA) and a United National Health System was started.

Doctors' Response: Nicaragua had one medical school in Leon and a second one was opened in Managua in 1981. By 1983, 2,240 medical students were undergoing training in these schools, an increase by four times over the 1978 level (Braveman and Roemer, 1985). Unlike in the case of Cuba, only about 300 of the total 1,300 doctors left the country due to the revolution. This was largely because private practice was allowed. Before the revolution, about 65 per cent of the doctors were paid for some public service, but for most of them this constituted only a few hours a day and the rest of the time they were engaged in private practice. After revolution they were pressurised to fulfill their contracted time and increase their scheduled public practice to at least six hours a day. Their salaries were standardised (Garfield and Taboada, 1984).

After revolution, the doctors' official organisation Federacion de Sociedades Medicas de Nicaragua (FESOMENIC), which is a leader of the Federation of Professional Organisations (CONAPRO) and has the backing of the propertied strata, increased its political activities. In 1980 when the government started discussing a law to regulate professional activities, it opposed it tooth-and-nail. It organised a one-day walk-out and even threatened mass emigration to Miami. The government retreated by making the law less specific. Nevertheless, the government passed the law and for the first time made the doctors and other professionals accept the government's right to regulate their professions. This tussle at the same time divided the professionals into the progressive and the conservative camps and in July 1981 a formal split took place. The progressives could maintain official recognition and this ultimately forced the consertatives to rejoin the organisation (Garfield and Taboada, 1984).

Personnel and Training: International assistance has greatly helped Nicaragua to fill up deficiencies in the number of personnel. There are about 800 foreign health workers in Nicaragua, coming mainly from Cuba, Latin America and Western Europe. Cuba and the Pan American Health Organisation have also greatly assisted in teaching programmes.

A complete overhauling of the medical curriculum has been carried out since 1979. The new six-year course consists of clinical service, teaching, administration and research. For imparting such integrated medical training, 'work-study programmes' are instituted wherein the student is required to assist from the outset in supervised public education projects, in community surveys to asses health needs, door-to-door programmes to give immunisations, serve as an administrative assistant in local public health offices, etc. The student is also placed in work settings to learn about occupational health and in outpatient settings to learn about preventive maternal and child health services. On the other hand, the clinical rotations are almost always hospital-based, thus creating a discrepancy between the primary care goal and hospital based training practices. This discrepancy is increasingly being questioned by the teachers and students (Braveman and Roemer, 1985).

Nicaragua has six nursing schools with five times the pre-1979 enrolment. The educational qualification required for enrolment has been drastically lowered. For Auxiliary Nurses the person should only be literate and ten months' training is given. Technical Nurses require primary school education and are given two years' training. While professional Nurses require secondary school graduation and are given three years' training (Braveman and Roemer, 1985). At this rate it is certain that Nicaragua will correct the present adverse nurse-doctor ratio very rapidly.

One of the earliest programmes started by the MINSA was training paramedical health aides, called *brigadistas*, who were selected from the youth organisations. They received several months' training and were sent to isolated rural areas. They were to serve for at least two years after which they would be eligible for professional training. In fact many of them went on to become health educators and medical students. The doctors forcefully opposed this programme and so it was revised: The revised programme took up mobilisation of a large number of people in the immunisation, malaria prophylaxis and sanitation campaigns which were launched in 1981. The campaign included a short-term training course and public health education. It is estimated that upto 10 per cent of the country's population was mobilised as health volunteers in these campaigns. The class and mass organisations listed earlier in this article actively participated and provided volunteers. They also promoted the formation of local, regional and national community health councils which are now active throughout the country (Garfield and Taboada, 1984).

But a campaign means a programme that ends at one point of time. This is not allowed to happen by converting the activity into permanent work by providing extensive training to a section of the volunteers. There are now 25,000 of these permanent but volunteer *brigadistas* comprising about 1 per cent of the total population (Garfield and Taboada, 1984). This supports our earlier contention that many of the workers and peasants are armed defenders of the revolution and also health workers. People's participation is not a cosmetic exercise, but is elevated to self-activity by the people to decide the condition of their lives.

Achievements of the Campaigns: As mentioned earlier, during and after the civil war, the incidence of malaria increased so much that there was no alternative but to take

up mass campaigns to bring it under control. The government opted for Mass Drug Administration (MDA) in 1981. Three ambitious goals were set: (1) to prevent new cases, (2) to cure subclinical cases, and (3) to reduce the transmission. For this purpose, 70,000 voluntary workers, *brigadistas*, were trained. These volunteers recruited many helpers. A malaria census was carried out in which 87 per cent were covered. The drugs were given to an estimated 19,00,000 people. More than 80 lakh does of chloroque and primaquine were distributed in October 1981.

As a result, the total number of malaria cases fell considerably from November 1981 to February 1982. However, the incidence of P.Vivax cases returned to endemic level by March 1982, while that of P.falciparum stayed below endemic level for three more months. The net result was that if we take the average of the previous two years' incidence rates as the baseline, there were 9,200 fewer cases of malaria than expected during the four months of reduction in general incidence. It is clear from this that the objectives of prevention and cure of malaria infection were better realised than that of reducing transmission, as the MDA could not reduce transmission to a 'break point' below which malaria eradication could occur (Garfield and Vermund, 1983). This shows that even such a massive exercise could not realise the theoretically possible decisive break in the chain of infection.

Compared to this moderate success of the MDA campaign, the *immunisation campaign* was a resounding success. BCG vaccinationis given at birth, and the three-fold increase in coverage since 1980 reflects a huge expansion in maternal care. Diptheria-pertusis tetanus (DPT) immunisation is given at health centres and health posts as part of routine child growth and development services. The DPT coverage is increasing at an average rate of 30 per cent per year. However, this increase is not so spectacular. Measles vaccination reches 60 per cent of children in the first year of life and 85 per cent before their sixth birthday (Williams, 1985).

The key to this success in immunisation is a mass campaign through holding regular 'health days' all over the country. For health days, 20,000 volunteer *brigadistas* have been trained in vaccination, health education, etc. On health days vaccinations are done between 7 am to 6 pm with schools, community buildings and health facilities as assembly points finishing with a house-to-house sweep through the neighbourhood. The results are announced through mass media (Williams, 1985). Table 2 shows the immunisation coverage.

TABLE 2: ESTIMATED IMMUNISATION COVERAGE OF CHILDREN UNDER 12 MONTHS

Immunisation	Percentage Coverage in	
	1980	1984
BCG	33	97
DPT	15	33
Poliomyelitis	20	76
Measles	15	60

Source: Ministry of Health and UNICEF Office, Managua (as given in Williams, 1985).

Health Financing and Facilities: Government funds directly related to the provision of health care jumped from 200 million *cordobas* in 1981 and reached an estimated 1,593 million *cordobas* in 1983. In 1981, the government budget for health was 12 per cent of all public spending (Garfield and Taboada, 1984).

In the last months of the revolutionary war, Somoza's National Guard destroyed four hospitals, seriously damaged five others and looted four more. Post-revolutionary reconstruction has now provided 18 hospital beds per 10,000 population. There are 4,829 hospital beds in Nicaragua, but greater awareness and accessibility has increased their use. Five hospitals with 1,078 beds are under construction (Garfield and Halperin, 1983). To tackle problem of diarrhoea, especially in infants, the government initially planned 170 rehydration centres, but popular demand and people's action have brought 226 such centres into existence (Halperin and Garfield, 1982). The availability of health services has increased tremendously. It is estimated that more than 80 per cent of the population now has some regular access to medical care (Garfield and Taboada, 1984).

Health Condition: Finally, about some overall achievements. The IMR has got reduced to 80 per 1,000 live births. No case of polio has been reported since 1982 despite an epidemic in neighbouring Honduras in 1984. Only 3 cases of diptheria were reported in 1983. Neonatal tetanus, however, still remains a significant problem (Williams, 1985).

In short, the reforms in health care in Nicaragua show people's determination to collectively change society. The future of the revolution is, however, not fully secure and is threatened by internal and external dangers. This has happened to all such revolutions. The Soviet Union was invaded by several countries to destroy the Bolshevik Revolution; Cuba had its Bay of Pigs invasion; Vietnam had to fight for decades for survival; Grenada was overpowered; Nicaragua has been assaulted by the CIA sponsored contras and a partial blocade since 1981. The very fact that it has achieved so much under conditions of a threat to its very survival and continous war since 1981 shows the revolution's lasting power, the new state's mass base and the preparedness of the working masses to sacrifice to preserve the gains of the revolution, including the gains in health and health care. Nevertheless, the war has its impact, and such protracted aggression has consequences for people's health. Epidemiology of war is an emerging subject and the war on Nicaragua has made it much more relevant. Health professionals will have to understand it more and more for the world is likely witness more revolutionary upheavals, revolutionary crises, and imperialist aggressions.

Health Consequences of War in Nicaragua

The Central American countries are under the grip of violence, more so since 1980. Violent death is the most common cause of death in El Salvador, Guatemala and Nicaragua since 1980. At least 40,00 people have been killed by military and death squads in El Salvador (population 47 lakhs) and many more have been killed in bombing and other attacks. It is estimated that 20,000 Gautemalans (population 41 lakhs) most of them indigenous tribes, have been killed by the army in the last three years. The war takes a toll mainly

of young men. This is illustrated by the fact that although life expectancy at birth among Salvadoran women has risen steadily, reaching 67.7 years in 1980, it fell remarkably for Salvadoran men from 58.4 years in 1978 to 52 years in 1980. More than 1,20,000 Central Americans have died from war-related causes since 1978. This amounts to a 10 per cent rise in mortality above expected levels during this period. It is estimated that more than a million Central American live as refugees within the region and a million have fled to America (Garfield and Rodriguez, 1985). This is how imperialism is trying to crush the hopes and rebellion of people in Central America, who have been inspired by the Nicaragua revolution. The effects of imperialist aggression on Nicaragua are no less tragic.

More than 100,000 persons were wounded in the revolutionary war in Nicaragua and 50,000 lost their lives. After the revolution, the CIA-backed contra attacks have, between January 1980 and January 1986, killed 3,999 persons, wounded 4,542 persons and 3,791 persons have been kidnapped. In 1985 alone, 1,852 persons' were wounded, 1,463 were killed and 1,455 kidnapped, indicating the counter-revolutionaries who have been killed in the armed conflicts—they are also victims of US aggression—the number of casualties totals 23,822 persons including 13,930 dead (Ortega, 1986). The president of Nicaragua, Daniel Ortega, in his recent speech to the National Assembly said that the total number of people killed as a result of the US policy of terrorism against Nicaragua would be equivalent, as a proportion of the population, to some 1,03,000 dead for the US (Ortega, 1986).

Ortega also gave information about other losses:

1. In 1985, aggression increased Nicaragua's balance of payment deficit by 108 million US dollars, the trade deficit rose by $ 89 million and the capital deficit by $ 19 million.
2. A total of 120,324 people have been displaced from their lands by the war, of these, 33,000 have been relocated to 55 urban and rural settlements.
3. Health services to 250,000 people have been impaired due to the damages caused to 55 health units, including one hospital and four health centres.
4. 48 schools have been destroyed and 502 other education centres can no longer operate because they are located in war zones; as a result, a total of 60,240 elementary and 30,120 adult education students are no longer able to attend classes.
5. In the area of social services, the mercenaries have destroyed four rural child care centres, three nutrition centres for children and two offices of the Nicaraguan Social Security Institute. This has directly affected services to 2,222 children and elderly people.

The strength of the Nicaraguan revolution lies in people's power and in its accomplishments in the fields of health, education (the revolution's strategy of imparting education to all has been most successful), nutrition, employment, etc. The counter-revolutionary contra mercenaries know this. Hence health and educational centres and health functionaries are made special targets of attacks. At least 22 health workers (including two European volunter physicians), medical students, nurses, malaria control workers, health educators and vaccination campaign workers have been killed while delivering health care (Siegel *et al*, 1985). Garfield (1985) puts the number of health workers killed at 31. In terms of availability of health facilities, as the Nicaraguan Health Workers Union (FETSALUD) reported to visiting American physicians, the increase the in the number of civilians and soldiers wounded in the war has strained existing health facilities, leaving less resources for normal civilian needs (Siegel, 1985).

Further increase in the health budget has been suspended due to increase in military spending, the budget for which increased from 18 per cent in 1982 to 25 per cent in 1984. Not only that, 20-25 per cent of Managua's health workers are at the war front, actually fighting with arms and many of them are getting killed. This has necessitated training of new health personnel.

The economic embargo on Nicaragua by the US has devastating consequences for health care. Immediately after the revolution, there was a crisis in the availability of pharmaceuticals. The foreign drug companies wanted the debt incurred by the Somoza government to be settled before sending any more drugs. The Sandinista government had to accept responsibility for the debts in exchange for favourable terms of repayment (Halperin and Garfield, 1982). Another major problem is the lack of spare parts for medical equipment. Much of the machinery is made in the US, but shortage of US dollars as a result of the war makes acquisition of replacement parts difficult (Siegel, *et al*, 1985). Thus, when equipment breaks, it may remain out of commission or one piece of equipment must be cannibalised to fix another (Helperin and Garfield, 1982).

In 1983, agricultural losses directly related to the war totalled 10 million dollars. Since 1981, total destruction related to health has been valued at over 70 million dollars (Siegel, *et al*, 1985).

Effects on Diseases

The term 'epidemiology of aggression' was first used by a group of doctors connected with Regional Leishmaniasis Group in Nicaragua, to analyse health data ascribable to the US aggression in 1982. Before 1979 leishmaniasis was known to exist in Nicaragua but was not reported to the WHO. After the revolution reported cases increased and came to ocupy the fifth rank among all notified infectious diseases. When the Leishmaniasis Group started a study of this disease in 1982 in one region, the study was violently interrupted after 24 hours by a contra attack in which several people were killed, including Dr. Pierre Grosjean, one of the two European volunteer physicians (Morelli, *et al*, 1985).

One aspect of the epidemiology of war is *the impossibility of obtaining basic data*. Cases registered in this region progressively increased from 1980 (143 cases) to 1982 (2,107 cases); since 1982, with the intensified war activities, the number of notified cases fell to 1,054 in 1983 and 806 in 1984. This is not due to actual decrease in number of cases but due to destruction of facilities, less access to services and migration. Another aspect of this epidemiology is related to troop movements. Non-immune people have the clinical manifestations when they enter, in troop movements, the natural environment of leishmaniasis. This can be seen from age-sex distribution: the significantly high incidence usually seen in under 5s has shifted to appear in males aged 15-30 years. The third aspect is related to migration. People living

in endemic areas often resettle, because of the war, in non-endemic areas, resulting in the first appearance of the disease in those zones. Thus, as the Leishmaniaris Group puts it, in the war-affected northern regions of the country, aggression and leishmaniaris, indeed, coincide 'epidemiologically' (Morelli, 1985).

Before we conlude, a mention should be made of the psychological effects of war. The Americans, for instance still suffer from the psychological effects of the Vietnam war and a numbr of studies are still being carried out to assess the increased number of vehicular accidents and suicides amongst Americans who were drafted to fight for US imperialism in Vietnam. As reported by Dr. Felipe Sarti, the chief psychologist at a psychiatric day centre in a poor suburb of Managua, approximately 25 per cent of all patients show depressive illnesses connected with the war. This depression is particularly prevalent among parents and siblings of soldiers who have been killed or sent to the front (Seigel, *et al*, 1985).

The US sponsored aggression is still continuing and no end to it seems likely in the near future. Such a situation can jeopardise the revolution in the long-term. This annihilation of revolution must stop. The US administration knows that if it opts for direct intervention, it won't be any cakewalk. The working masses are armed and they will fight till the last person. And hence this new strategy of protracted aggression combined with economic harassment and internal sabotage through the still-unexpropriated big strata of the former ruling classes. The danger is real. If a massive counter revolutionary attack is mounted by all of them it will have a chilling effect on the revolutionary movement all over the world. Even if such an attack fails, there are bound to be major distortions in the revolution. Its democratic fermen. may get lost. A massive bureaucratic state apparatus may emerge and with the best class-conscious workers and peasants dead in the war, such an apparatus can get consolidated. International solidarity is a need of the hour.

Many health professionals have reacted with revolutionary zeal to this need. Today, over 900 internationalist health workers are helping the revolution. They are from Cuba, Latin America, Mexico and Europe. Many more can and should join. If we allow imperialism to roll back this revolution, as it did in Grenada, history will not forgive us. No matter how strong the justification for localist thinking and local-based activity, this international defeat will affect all of us sooner or later. We must say, "Imperialism—hands off Nicaragua".

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