

WATER IN THE PALESTINIAN OCCUPIED TERRITORIES:
IMPLICATIONS FOR HEALTH

(Excerpts from observations and interviews during tour of West Bank and Gaza Strip areas between July 1 and July 30, 1991 by Anna Bellisari, Wright State University)

Na'im T., M.D. (Union of Palestinian Health and Works Committee - 7/6/91): Most common health problems treated at Beit Sahour clinic are skin and intestinal infections, mainly the result of inadequate water supply and sanitary facilities. Claims that Israeli settlements pollute Arab water supplies.

Small clinic we visited in Dar Salah near Bethlehem has instituted chlorination program and a community education program concerning clean water. Each home has its own well or cistern, requiring individual treatment. Clinic's own water supply is representative of pollution problem; it is located in a depression behind building, a place where animal feces and other pollutants collect during the rainy season. On a larger scale, water run-off from the Judean hills into the valleys where crops are grown carries pollutants, garbage, and infective microorganisms to the plants in the valley.

Omm Toba is a small Palestinian village on the Green Line between Jerusalem and Bethlehem, the home town of Dr. Na'im. The village water supply has been pumped over the hills to Jerusalem for the last 15 years, and villagers must now pay for their own water. They also pay for sanitary and garbage services, but do not receive the services in their homes. The evidence (garbage) lay along the side of the tiny road leading into the village - the larger main road had been blocked off by the military.

Dahaisha Camp is situated on rocky, hilly area south of Bethlehem. According to an undated report in the resource room at the Birzeit Community Health Unit, the elevation of various areas in the camp varies by as much as 200 feet. Waste water from homes at higher elevations runs down to those at lower levels. Most water is collected in a cesspit which is pumped out by UNRWA tankers, but the cesspit often overflows because it is too small to contain all waste, and the pumping is done too infrequently. Open channels throughout the camp collect waste and storm water, and they also often overflow. I saw this overflow during a brief visit to the camp. During my visit I was told that Japan and Italy have contributed funds to build a sewage network in the camp to be connected to the Bethlehem Municipal system, but construction has not begun.

Manuel H. (Bethlehem University - 7/8/91): Beit Jallah water is shut off 2 days per week.

Arafat H., M.D. (West Bank UNRWA - 7/13/91): Camp reserve water supplies in tanks on roofs and outside camp are usually insufficient to last through extended curfews. UNRWA provides free water at pumps in camps, but many refugees prefer to connect to

private source even though they must pay fee. Jericho family controls Wadi Qelt water (sand filtered), which was purchased by some refugees. Water became polluted by Israeli settlements, so Palestinians purchased Mekorot water. However, this is highly saline. No epidemics have occurred as result of water supply problems in the West Bank, although a few cholera cases have been reported. Water shut-offs are frequently used as collective punishment by Israeli authorities.

Muna (Dermatologist at UPHWC Clinic in Jabalya Camp - 7/14/91): Skin problems, including infections, are very common here. These are at least partially due to crowded living conditions and lack of adequate sanitary facilities. During wet season, fungus infections become very common. Parasitic and other gastrointestinal infections are also prevalent, and are related to water sources.

Water cut off in Jabalya Camp today, so people must carry it from the camp wells. Neighborhoods located farthest from wells have pumps and own wells, but because of lowered water table, pumps are ineffective.

Dentist at Jabalya Clinic (7/14/91): Fluorine concentration in Gaza Strip water supply is very high. Result: toxic fluorosis, which causes dark-stained, brittle tooth enamel.

Masoun el-G. (Gaza Municipality - 7/14/91): She has worked with Gaza water supply for 14 years. She stated that the Gaza Strip has 13 wells, costing municipality 1.5 million NIS per month. Two wells are closed, but permission to dig new ones has been denied. Water is very salty, not potable. Because of damage to Gaza City piping system, water does not reach all areas of the city, especially neighborhoods located in southeast section of city. About 50% of all piped water is lost because of damaged pipes, which are never repaired. Highly saline water is said to be causing kidney and liver disease, but this has not been scientifically documented. Water is also polluted, especially in the 70-80 m deep wells. Gaza City has only partial sewage system, only 4 to 5 neighborhoods are included. This sewage system is Israel's responsibility. Although a program to clean sewage was developed in 1971, it has not been implemented. Gazans are not permitted to use sewage for irrigation.

Akram Saleh M., M.D. (Gaza Environment Program - 7/1/91): Gaza Strip's hard and polluted water contributes to development of kidney stones, skin diseases, infectious diseases. Water contains excessive nitrates, fluorides.

Saudi Arabia contributing funds for Palestinian housing and water improvements.

GEP conducted program to clean Gaza seashore for children's use, but sea water is polluted by sewage and garbage.

A research assistant at Birzeit Community Health Unit told me of a project on Ascaris infestation conducted in the Gaza Strip. More than 50% of the children studies were infected, but mothers

did not consider the worm infestation a health problem, since everyone has worms. Simple handwashing, found to correlate with a reduced degree of infestation, was recommended to Gaza residents.

Hosam el-A. and family (Jabalya Camp refugees - 7/14&15/91): Family of at least 12 persons, relatively prosperous because two men in family have chicken butchering jobs in Israeli supermarket (these two are college educated). Family has concrete latrine (no seat) in small room just inside front door. An electric pump delivers water to a sink also near front entrance, but the water was shut off on the morning of the 15th and reserve water had to be used. There is a shower, but no running water in the kitchen. To wash dishes women pour water from the shower into plastic buckets and tubs and wash the dishes on the kitchen floor. Although family pays 100 NIS for electricity and 30 NIS for water each month, there are frequent shut-offs of both. During my 17-hour visit, the electricity and water were off once each.

I observed the Gaza City cesspool, apparently the collection place for sewage of neighborhoods not connected to sewage system. Garbage is dumped on its banks, and some of it was burning. About 15 children appeared immediately after we stopped the car. They apparently play near this cesspool.

I also observed the Jabalya Camp sewage network, which consists of some concrete-lined ditches (and some with no lining) running from individual homes toward the sea. One rather large lined ditch was partially blocked by garbage. Garbage containers throughout the camp were filled to overflowing, and garbage and trash were strewn in the sand around them.

Ramzi S., Ph.D. (Director of Center for Environmental and Occupational Health Studies at Birzeit University - 7/20/91): Center is one of few units of Birzeit University which is officially operating. The Center's eight employees conduct lab and field studies on water and other environmental concerns. Attempt to conduct high quality, controlled studies, but lack statistician. Until recently Center had a permit to continue laboratory work. Permit has not been renewed, but Center is still continuing operations. A new water analyzer was promised by UNDP, but Israelis control access to such contributions and have not permitted delivery yet.

Center conducted a 2-year analysis of fluoride content in Gaza underground water supply, testing 353 5-16-year-olds in Gaza Strip UNRWA schools. Found high fluorine index of 3.5 (on 0-5 scale) and high rate of dental fluorosis. All samples studied were above normal, and there was damage to tooth enamel and gums. A cultural factor confounds the relationship between fluoride content and dental fluorosis, however. Gazans were found to drink more and stronger tea than persons in the West Bank - more than 3 cups of dark tea per day per person. Even children drink considerable quantities of tea. Tea leaves naturally have high fluorine content. Much fish is eaten in Gaza also - fish also contains considerable amounts of fluorine.

Studies of skeletal fluorosis and of the impact of high salinity upon kidneys, blood pressure, etc. are needed. Hospital records are "chaos," and cannot be used for prevalence and incidence studies (however, I noticed that Beit Sahour clinic kept good patient records written in English).

The largest West Bank water network is the Jerusalem Water Authority, a private Jewish company in the Shufat-Ramallah area. This company contracted with the Center for analysis of its water supply, which was found to contain some bacterial pollutants related to line breaks. No chemical pollutants were found in this water supply. The company responded quickly and favorably when the Center recommended cleaning its reservoirs.

A major public health problem in the West Bank is due to contamination of agricultural products by pesticides, which are overused and misused by farmers (both Israelis and Arabs). Pesticide use practices, as well knowledge and attitudes regarding pesticide use, were documented in a Center study, but pesticide pollution of the environment, including water supply, has not been investigated.

Taroub H., M.D. (UNRWA Clinic Director, Jerusalem - 7/22/91): She took me to see the village of Ein 'Arik northwest of Ramallah. This village has a natural spring, which is the only source of water for four neighboring villages. The water is "probably polluted." The village is 4000 years old and located in a very hilly area. Women and children from surrounding villages come to the spring with buckets and cans, fill them at the open spring, and carry them on their heads, backs, carts, donkey-drawn wagons to their homes.

The nearby clinic at Kufr Ne'am has its own well, but the water is polluted and unusable, so water is purchased for 15 NIS per week, delivered by truck, and stored on the clinic roof. The clinic physician stated that a major health problem in this area is the early onset of arthritis and rheumatism in relatively young (about age 40) rural women, while men develop symptoms much later. He believes that the arduous and difficult work (which includes carrying water) women do is partly responsible for this pattern. Polluted water is the cause of gastrointestinal parasitic and bacterial infections, also high on the list of common health problems. This physician claims that all water sources in area are polluted. Surrounding villages were offered piped water, but villagers refused because 1) they are too poor to pay for pipelines and infrastructure and 2) the water supply is controlled by Israeli collaborators. During the drive through this rural area a number of Jewish settlements were visible on nearby hilltops. They apparently have piped water, good access roads, etc., and some even have swimming pools and plenty of water to sprinkle lawns.

Mustafa B., M.D., and others on mobile clinic team (7/26/91): I joined team on regular trip to the village of Kufr ed Dik on the West Bank. Clinic is held in abandoned home here once a month. Major health problems related to water supply that were treated

today were skin and gastrointestinal infections, and infestation by helminthic worms. Clinic physicians believe that treatment for these infections is virtually useless without improvement of living conditions, including water supply, sanitary facilities and daily hygiene practices.

There is no water system in this village of 2000 persons (population reduced from original 5000) - each home has its own supply. The owners of house used as temporary clinic collected rain water on the roof during the rainy season, stored the water in a covered cistern under the front porch, and delivered the stored water to a sink on the porch via a small electric pump. The water is tested regularly. A large metal tank located in the center of the village is used to store purchased water during periods of drought or water shortage.

The following notes are from the Resource Library of MAP/Canada on Nablus Road in East Jerusalem:

1. Union of Palestinian Medical Relief Committees and Birzeit University Community Health Unit, 1988. Ain Al-Dyuk: A Village Health Study.

A natural spring unites the Upper Village and the Lower Village. Water is conducted to both parts of the village via a canal, which provides the only water for drinking and irrigation. A 1987 survey of 96 households (847 persons) in the village found that 85% had no potable water. These households use the canal water, which is delivered by hose to the houses. Of the children under 5, 45% suffered from parasitic infections. Most common infective agents are Entamoeba coli, Giardia lamblia, Hymenolepis nana, and Entamoeba histolitica. A statistical correlation was found between parasitic infection and malnutrition in the children, with a higher rate of malnutrition among girls than boys. Military authorities refused village permission to construct a water network from the spring to deliver clean water to all homes. Land and water belonging to one of the 9 village clans was confiscated by military authorities. Previous owners now work as hired laborers on what was once their land and purchase what was once their water.

2. Kaspari, S. and A. Condie, 1986. Intestinal parasitic infection of refugee children in selected West Bank localities. Birzeit University Community Health Unit Occasional Papers.

Children (N=455) in grades 1 and 6 in four schools were sampled. Three schools were in refugee camps (Deir 'Ammar, Jalazon, al-Amari) and one was a village school (al-Awja). The village has no potable water source. 48% of the children were infected; the village had a 61% infection rate. Boys and younger children had higher infection rates than girls and older children. E. coli was responsible for 21% of all infections. The children were aware of the need for hygiene, but lacked facilities.

3. Smith, Chris, 1984. Bacterial quality of drinking water in eight villages in the Jordan Valley. Birzeit University Community Health Unit Occasional Papers.

All eight villages lacked acceptable drinking water. Jiftlik uses water contaminated by Nablus raw sewage.

4. Smith, Chris, and Hala Salem, 1986. Statistical Report: Disease diagnoses at Birzeit Women's Charitable Society Clinic during one year, 1 October 1984 to 30 September 1985.

Respiratory and gastrointestinal infections predominate. Highest rates of skin and GI diseases were found in villages without potable water. Women had higher rates of urinary infections and arthritis than men.