

Cancer risks in the Druze Isifya Village: Reasons and RF/MW antennas[☆]

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Received 5 February 2010; received in revised form 30 April 2010; accepted 4 May 2010

Abstract

Background: The present study was initiated to examine the claims of the residents of the Druze Isifya Village in Northern Israel that their high cancer rates were associated with the past exposures to radiation from radio and cellular transmitters. **Objective:** To investigate the association between past exposure to RF/MW transmitters and cancer risks, taking into account familial cancer history, occupational exposures and indicators of life-style. **Methods:** We carried out a population-based case-control study involving 307 residents, of whom 47 were diagnosed between 1989 and 2007 with different types of cancer and 260 controls. Cancer diagnoses were obtained from medical records. Exposure status of individual houses were determined from a map, based on the distances between each house and RF/MW antennas, and were calculated using geographic information systems (GIS) tools. Data on additional risk factors for cancer, like smoking and occupation, were obtained from individual questionnaires. The analysis was adjusted for measures of life style and occupational exposure, and Binary multiple logistic regressions was used, for all cancer sites and for individual cancer types for those cancers with at least 5 documented cases. **Results:** Past occupational exposures to chemicals (e.g., pesticides) and electronics, were found to be strongly associated with increased cancer risks (all sites: OR = 2.79; CI = 1.14–6.82; $P < 0.05$), but no discernible trend in overall cancer risk was associated with proximity to sources of past RF/MW radiation exposure ($n = 47$ OR = 1.00; CI = 0.99–1.02; $P > 0.4$). Colorectal cancer showed a negligible elevated adjusted risk associated with radiation intensity ($n = 11$ OR = 1.03; CI = 1.01–1.05; $P < 0.01$). **Conclusion:** There was evidence for an increased risk of cancers which were associated with chemicals in manufacturing and agriculture and electronics, where there may have been exposures to EMF, but the study did not confirm the suspicion of increased cancer risks associated with radiation for most cancer types in this village. Misclassification of past exposures could explain the negative finding.

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Keywords: Cancer; Agrochemicals; Electronics; Microwave radiation; RF/MW transmitters; Retrospective study

1. Introduction

The general public has become increasingly exposed to radio and microwave radiation at frequencies of 100 kHz–300 GHz from radio and cellular transmitters, wireless computers (Wi-Fi technology), wireless telephones with base stations in the house (the DECT technology), personal digital assistance (PDA) devices and cellular phones. There is uncertainty, however, as to whether these

exposures pose risks for cancer and other health effects. Several studies have been published to date describing the relationship between RF/MW radiation exposure from base stations and different health symptoms, such as sleep disturbances, heart rhythm disruption, headaches, dizziness and depression (see *inter alia* [1–4]).

However, epidemiological evidence on community RF/MW radiation and cancer accumulated to date is based mainly on associations, and assessments of group exposures, without information on individual exposures, and therefore may be biased towards the null by exposure misclassification. Several studies indicated an increased risk for cancer associated with living in vicinity of transmitters, but these studies had less than complete information on exposure assessment and possible confounders [5–10].

[☆] I, as Editor in Chief, present my apologies to the authors as this paper appears only in 2011 although it was accepted already in 2010. We have tried to clarify the reason and will smooth the workflow in the future.

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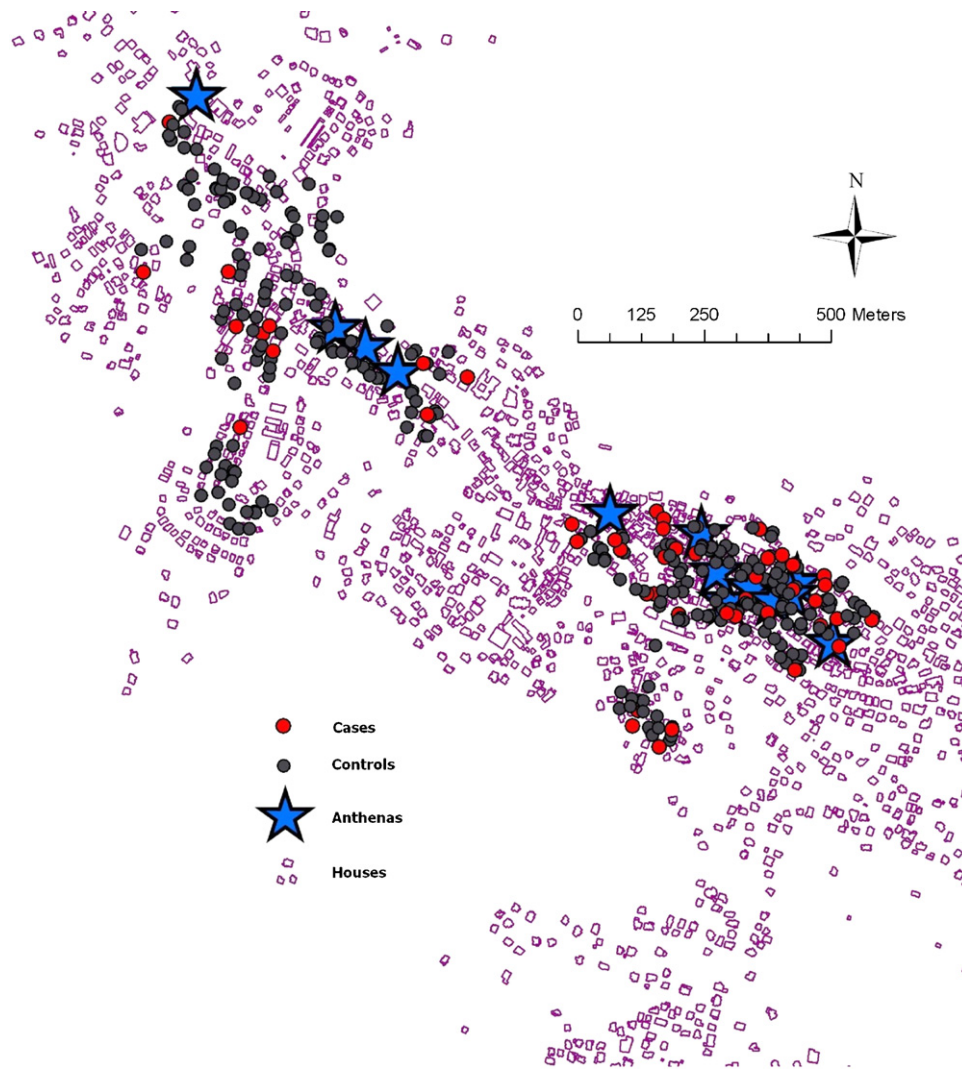


Fig. 1. The map of the Isifya village with houses, research subjects in neighbourhoods A, B, C, and RF/MW transmitters.

Isifya Village is located on the top of the Carmel Mountain (about 750 m above the sea level). Its hilltop location made it especially attractive for communication companies to erect their towers and antennas as they can so cover wide distances with their services. The first radio transmitters in the village were erected in the beginning of the 1970s. Cellular antennas were added in the 1990s. In 2000, all the cellular antennas and radio transmitters in the village were destroyed by local residents who attributed different health symptoms to the radiation [11,12].

According to the National Cancer Registry [13], there was an excess of cancer morbidity in Isifya, during the years 1998–2001, especially in men (RR = 1.57; CI (95%) = 1.12–2.02). There were specific types of cancer for which it was possible to make individual calculations. For lymphoma, in men on the basis of 7 cases in this period, RR was 2.28; (CI_{95%}: 0.59–3.97) and colorectal cancer rate in men, on the basis of 8 cases, the RR was 2.01 (CI_{95%} 0.62–3.4) *ibid*.

The aim of this study was to determine the possible reasons of cancers and if there were elevated cancer risks associated with living in proximity to non-ionizing radiation emitting transmitters. The study was carried out to address concerns of the local residents of the village about their exposure to radio and cellular transmitters.

2. Materials and methods

The present analysis is a retrospective follow up study. Because most houses in the village do not have street numbers, cancer registry data were unavailable for the study. Therefore, in the analysis, we relied on medical documents with confirmed diagnosis of cancer. Informed consent forms were signed by all the participants. The questionnaires were filled in face-to-face interviews by a single interviewer (IA) in the participant's home. The questionnaires included questions about cancer history in the family; education;

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