Executive Summary

The focus of this report is electromagnetic fields of the type that occur in connection with mobile telephony, so called radio frequency (RF) fields and the possibility that exposure to such fields poses a risk of disease or ill health. The purpose is to describe what was known ten years ago, what we have learned during the past decade, and where we stand today.

TEN YEARS AGO

The mechanism of interaction between RF fields and the human body was established long ago and is increased temperature of exposed tissue (compare microwave ovens). Methods for measurements of the fields in the air were developed early but the data on distribution of the absorbed energy in the human body was still restricted. Data regarding sources and levels of exposure to the population was limited because systematic measurements had not been conducted. A considerable number of provocation studies on exposure to fields of lower frequencies (related to electric power and computer screens) had already been conducted and had not found any evidence of an association to symptoms (headache, vertigo, dizziness, concentration difficulties, insomnia) but the corresponding information about RF fields and occurrence of symptoms was scarce. Few and methodologically limited epidemiological studies had been conducted on RF field exposure and cancer.

WHAT WAS LEARNED DURING THE PAST TEN YEARS

Extensive research on various aspects of RF fields has been conducted during the last ten years and the knowledge database has increased considerably. Simulation models have improved our knowledge about how the fields and the energy are distributed in the body. Mobile, so called, exposimeters have been developed for use in epidemiological studies. Many more measurements have been conducted to increase our knowledge about sources and level of exposure to the population.

More than 15 provocation studies (single or double blind) have been conducted on symptoms attributed to exposure to RF fields. These studies have not been able to demonstrate that people experience symptoms or sensations more often when the fields are turned on than when they are turned off. One longitudinal study has looked at frequency of symptoms in relation to environmental exposure and this study found no association between exposure and symptoms.

A considerable number of studies on cancer, and in particular brain tumor, were presented. As a consequence there exist now very useful data including methodological results that can be used in the interpretation of this research. With a small number of exceptions the available results are all negative and taken together with new methodological understandings the overall interpretation is that these do not provide support for an association between mobile telephony and brain tumor risk. In addition, national cancer statistics are very useful sources of information because mobile phone usage has increased so quickly. Had mobile phone use and brain cancer risk been associated it would have been visible as an increasing trend in national cancer statistics. But brain cancer rates are not increasing.

WHERE WE STAND TODAY

We now know much more about measurements and absorption of RF fields and also about sources of exposure to the population and levels of exposure. A considerable number of provocation studies on RF exposure and

symptoms have been unable to show any association. Overall, the data on brain tumor and mobile telephony do not support an effect of mobile phone use on tumor risk, in particular when taken together with national cancer trend statistics throughout the world.

Research on mobile telephony and health started without a biologically or epidemiologically based hypothesis about possible health risks. Instead the inducement was an unspecific concern related to a new and rapidly spreading technology. Extensive research for more than a decade has not detected anything new regarding interaction mechanisms between radiofrequency fields and the human body and has found no evidence for health risks below current exposure guidelines. While absolute certainty can never be achieved, nothing has appeared to suggest that the since long established interaction mechanism of heating would not suffice as basis for health protection.