

## PREFACE

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*That malnutrition increases susceptibility to infectious disease seems a reasonable assumption, and clinical observation in areas where malnutrition is common has generally lent support to this belief. Equally reasonable is the supposition that infectious diseases have an adverse effect on the nutritional state. It is only comparatively recently, however, that systematic studies have been undertaken to explore in detail the complex interactions between nutrition and infection.*

*WHO began to take an interest in this problem early in its history. In 1950 a Joint FAO/WHO Expert Committee on Nutrition recommended that studies should be made on the relation of nutritional status to resistance to intestinal parasites. During the next few years, evidence gradually accumulated that protein-calorie malnutrition in infants and young children was the most serious nutritional problem in developing countries and that acute communicable diseases of viral and bacterial origin were among the main contributory factors. Furthermore, a series of investigations by the Institute of Nutrition of Central America and Panama (INCAP), with WHO support, demonstrated the interaction between nutritional deficiencies and many of these diseases, especially acute diarrheal disease. Meanwhile, experience gained in various WHO-assisted programmes for the prevention and control of communicable diseases suggested that many were associated with malnutrition.*

*The time therefore seemed ripe for a broad examination of the interrelationships between malnutrition and diseases caused by a variety of pathogenic organisms, including bacteria, rickettsiae, viruses, protozoa, and helminths. In 1965, a WHO Expert Committee on Nutrition and Infection reviewed the whole question and put forward suggestions for a comprehensive programme of research. This was designed to determine the effects of infection on nutritional status, the effects of malnutrition on resistance to infection, and the mechanisms of interaction between nutrition and infection. Such a programme demanded, in the first instance, a careful sifting of the vast amount of epidemiological, clinical and experimental evidence already available. The present monograph is intended to meet this requirement.*

*The three authors have been collaborating closely for many years. Dr Gordon and Dr Taylor first came together in 1953, when they pooled their*

*ideas concerning synergism and antagonism in associated diseases and set out to explore these relationships, both in the field and in the laboratory. Meanwhile, Dr Scrimshaw was collecting data in Panama and in Guatemala on the association of malnutrition and acute infection among the local populations. In 1958, he met Gordon and Taylor and the three decided to undertake a detailed review of the published evidence and of their own experiences concerning synergism and antagonism in relation to nutrition and infection. This review, published in 1959 in the American Journal of the Medical Sciences, provided a basis for the first four chapters of the present monograph, but much new material has been added, and the evidence has been re-evaluated.*

*Chapter 5 is an expanded version of a paper published in 1963 which analyses and illustrates the epidemiological principles that have to be observed in carrying out field studies on problems of the kind discussed in the monograph. Chapter 6 is devoted to a particularly striking and important example of a synergism between infection and malnutrition—that of weaning diarrhea. This brings together a vast store of information from a number of articles already published by the authors elsewhere and some more recent findings of studies carried out by INCAP. The last chapter presents a short summary of the present state of knowledge regarding interactions of nutrition and infection, and discusses the public health implications.*

*The manuscript of the monograph was circulated in draft form to seventeen experts in twelve countries for their comments and suggestions, which have been taken into account in preparing the final text. The names of these reviewers are listed on page 8. Their collaboration, and that of the many persons who have supplied unpublished information, is greatly appreciated, both by the authors and by WHO.*

*Dr Scrimshaw, Dr Taylor and Dr Gordon have performed a great service in awakening clinical interest in the interrelation of infectious disease and malnutrition and drawing attention to its public health importance. The World Health Organization is deeply indebted to them for the thoroughness with which they have undertaken this comprehensive review of the subject and the immense amount of time they have devoted to the project.*

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