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EPIDEMIOLOGICAL TRANSITION IN INDONESIA:
Impact of Helminths and Urbanization on The Development of Type 2 Diabetes

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The research presented in this thesis was performed at the Department of Parasitology, Leiden University Medical Centre, Leiden, The Netherlands; the Department of Parasitology, Faculty of Medicine Universitas Indonesia, Jakarta, Indonesia; the Division of Metabolism and Endocrinology, Department of Internal Medicine, Faculty of Medicine Universitas Indonesia, Jakarta, Indonesia; and the Nangapanda Community Research Centre, Ende, Indonesia.

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About the cover: Illustration of the two different study areas described in this thesis. The upper part depicts Nangapanda (Flores), a rural area, which is characterized by its beautiful tropical beach which has a stretch of green stones and coconut trees. The lower part depicts Jakarta, the capital city of Indonesia, an urban area, which is characterized by its skyscrapers and the National Monument (Monas). The border between the upper and lower part is represented by the presence of soil-transmitted helminths (the brown-coloured curved lines).

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This thesis is dedicated to the memory of my father, C.H.B. Benny Tahapary, who inspired me; to my mother, Endang Soeprapti, who has provided unconditional love and patience; to my wife, Maria Larasati Susyono, who has supported me in all my endeavours; and to my sons, Nicholas, Sebastian, and Olivier, who make it all worthwhile.

He has made everything beautiful in its time.
Ecclesiastes 3:11
Chapter 1  General Introduction
(Adapted from: Challenges in diabetes management in Indonesia: a literature review. [Globalization and Health 2013] and Helminths, hygiene hypothesis and type 2 diabetes [Parasite Immunology 2017])

PART I  What is the effect of anthelmintic treatment (deworming) on host metabolic homeostasis?


Chapter 3  Effect of anthelmintic treatment on insulin resistance: a cluster-randomized placebo-controlled trial in Indonesia. (Clinical Infectious Disease 2017)

Chapter 4  Effect of anthelmintic treatment on leptin, adiponectin, and leptin to adiponectin ratio: a randomized controlled trial. (Manuscript submitted)

PART II  What are the differences in metabolic profiles between populations in rural and urban areas?

Chapter 5  Impact of rural-urban environment on metabolic profile and response to a 5-day high-fat diet. (Manuscript submitted)

Chapter 6  Summarizing Discussion
(Adapted from: Helminths, hygiene hypothesis and type 2 diabetes. Parasite Immunology 2017)

Appendix  Summary
  Samenvatting
  Curriculum vitae
  List of publications
  Acknowledgements