

# Immunological resilience and biodiversity for prevention

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March 25, 2021

## Abstract

Increase of allergic conditions has occurred at the same pace with the Great Acceleration, which stands for the rapid growth rate of human activities upon Earth from 1950s. Changes of environment and lifestyle along with escalating urbanization, are acknowledged as the main underlying causes. Secondary (tertiary) prevention for better disease control has advanced considerably with innovations for oral immunotherapy and effective treatment of inflammation with corticosteroids, calcineurin inhibitors and biologic medications. Patients are less disabled than before. However, primary prevention has remained a dilemma. Factors predicting allergy and asthma risk have proven complex: risk factors increase the risk while protective factors counteract them. Interaction of human body with environmental biodiversity with micro-organisms and biogenic compounds as well as the central role of epigenetic adaptation in immune homeostasis have given new insight. Allergic diseases are good indicators of the twisted relation to environment. In various non-communicable diseases, the protective mode of the immune system indicates low-grade inflammation without apparent cause. Giving microbes, pro- and prebiotics, has shown some promise in prevention and treatment. The real-world public health programme in Finland (2008-2018) emphasized nature relatedness and protective factors for immunological resilience, instead of avoidance. The nationwide action mitigated the allergy burden, but in the lack of controls, primary preventive effect remains to be proven. The first results of controlled biodiversity interventions are promising. In the fastly urbanizing world, new approaches are called for allergy prevention, which also has a major cost saving potential.

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